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NEW BRUNSWICK'S MINERAL INDUSTRY 1984

Edited by
Barbara M. W. Carroll

Mineral Resources Division
Department of Natural Resources
Province of New Brunswick
1985

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PREFACE

This is the eighth in a series of reports on the Mineral Industry of New Brunswick. The information contained within the report, which is not contained in our normal series of reports, will serve as a historical record of exploration, development, mining and government activities as well as related matters that have taken place within the Province during 1984.

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CHAPTER 1. GOVERNMENT PROGRAMMES

MINERAL RESOURCES DIVISION[1]

New Brunswick, like other provinces in Canada, has traditional responsibilities with respect to the mineral resources it owns and controls. It administers, through a number of Acts, all matters related to the exploration, development, production, smelting, refining, transportation and taxation of its basic metallic, non-metallic and structural material resources. The Minister of Natural Resources has sole responsibility of these Acts, which are administered by the Mineral Resources Division of the Department of Natural Resources.

The first attempt by the Government of New Brunswick to evaluate its mineral potential was made in 1838 when Dr. Abraham Gesner was appointed to carry out a geological survey of the Province. Gesner was probably the first provincial geologist in Canada, and New Brunswick the first to initiate a formal geological survey. An astute and enthusiastic observer, Gesner stated in his first of four reports published in 1839:

> "The geological and mineralogical exploration of New Brunswick was commenced under circumstances truly embarrassing; but, from the results already produced, it cannot fail to mark a new era in the history of the Province. It will be seen in the body of this report, how important this inquiry is to the prosperity of the country, and so great are the discoveries already made, even in the commencement of the undertaking, that the names of those who have supported the object will be remembered with gratitude by succeeding generations.
>
> "Hitherto the energies of the Province have been directed to the exportation of timber in its different forms, and the commerce of the Colony has been greatly enlarged from the fine forests which formerly occupied the interior of the country. But timber is gradually becoming more scarce, the expense of procuring it is annually increasing, and the time will come when other objects for exportation must be sought for. It is then certainly desirable that other resources of the country should be opened, and while the agricultural districts

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1 Written by Dr. R.R. Potter, Assistant Deputy Minister.

are encouraged and protected, the riches contained in the bosom of the earth should not be overlooked."

The results of Gesner's work stimulated much interest and discussion. There was new awareness of the geology and mineral potential of the Province, and a general positive attitude toward industrial development. Gesner was followed by government, university and other geologists including James Robb, L.W. Bailey, G.F. Matthew, C.F. Hartt, R.W. Ells, C. Robb, R. Chalmers, H.S. Poole and H.Y. Hind. After Confederation in 1867, basic geological surveys were continued by the same workers, but under the employ of the Geological Survey of Canada.

In 1816, an Act for the Encouragement of Trade in Gypsum was passed. A mining lease for coal was issued in 1835, and in 1858 the first act related specifically to mines and minerals was passed. It dealt mainly with mining licences. The General Mining Act of 1891 contained many principles of current legislation, including mining claims, called prospecting licences at that time. An Act to Encourage the Discovery and Development of Oil and Natural Gas was introduced in 1899, and in 1927 the General Mining Act was passed. It contained most of the concepts of the present act. The Ownership of Minerals Act was passed in 1953, and the Mining Income Tax Act in 1954. Other important legislation passed included the Bituminous Shale Act (1967), the Quarriable Substances Act (1968), the Pipeline Act (1976), and the Underground Storage Act (1978).

The basic one-inch-equals-four-mile bedrock and surficial geological mapping of the Province was completed about 1900. In the years prior to and after World War I, the Provincial Government adopted a passive role toward mineral development. At that time, only a few limestone, gypsum, and building stone quarries were in operation, plus the coal mines at Grand Lake and the oil-gas field at Stoney Creek.

The foundations for the growth and development of New Brunswick's mineral industry were laid in 1926 when a modern mining act was passed in the legislature. Dr. W.J. Wright was hired as Provincial Geologist and the Province began to adopt a more active approach toward the development of its mineral resources. Much basic mapping was completed by both the then Department of Lands and Mines and by the Geological Survey of Canada. University students and professors were also actively involved in this work, particularly Dr. G.S. MacKenzie, S.C. Perry, F.J. Alcock and others. The new Mining Act, the Government's positive approach toward investment, as well as the basic surveys carried out by Dr. Wright and his colleagues, were basic ingredients for the growth of the mineral industry as we know it today.

After World War II, there was considerable growth in the development of peat bogs in the northeastern part of the Province. A new cement plant was also constructed at Havelock.

The Mines Branch of the Department of Lands and Mines was staffed by less than six employees at the time base metals were discovered in the Bathurst-Newcastle area in late 1952. They were completely unprepared for one of the largest staking rushes in Canadian mining history which followed in 1953. The main concern was, at that time, administration of mineral rights. Northern New Brunswick was explored quickly, and by 1960 more than 30 base metal deposits of various sizes had been discovered. Progress was slowed down by an economic recession in 1957-58; however, by the mid-sixties the Wedge, Brunswick, Heath Steele and Nigadoo mines were in production. A zinc-lead smelter and fertilizer plant were constructed at Belledune on Bay of Chaleur, and the Province's base metal industry was becoming firmly established.

In 1964 the Province recognized the potential for growth of mining, and enlarged the staff of the Department of Lands and Mines to evaluate the mineral potential of other relatively unexplored parts of New Brunswick. This work was completed in 1970 when the new Mines Division of the Department of Natural Resources and the Canada Department of Regional Economic Expansion signed a $3.8 million agreement to accelerate basic geological surveys, conduct feasibility studies for further processing, and do other work to stimulate investment. One of the projects included the diamond drilling of salt structures in the Sussex area, which resulted in the discovery by geologists of the Department of Natural Resources of economically interesting potash and high-grade salt at three locations. Fortunately, subsequent exploration by experienced companies has been successful, and the three areas of potash potential identified are now at various stages of development. The first muriate of potash was shipped from the Potash Company of America mine in late 1983. A second $11.3 million agreement was signed in 1975. More basic geological work was completed as well as extensive inventories of granular aggregate, peat and industrial minerals. Further research related to methods of improving metal recoveries was also completed. Resource roads were built and special emphasis was placed on programs to make the public more aware of the contributions of the mineral industry to the economy of the Province.

On June 21, 1984, a five-year $22.7 million agreement was signed to initiate a number of programs to be carried out by the Mineral Resources Division of DNR and the Canmet and Geological Survey Branches of the Canada Department of Energy, Mines and Resources. There are four main programs, all designed to promote the exploration, development, mining, smelting, refining and marketing of the Province's minerals. The EMR share of the agreement totals $15 million, and the Province's share totals $7.3 million.

The Mineral Resources Division is one of five divisions of the Department of Natural Resources (Figure 1a). The Division consists of two branches: the Geological Surveys Branch and the Mineral Development Branch (Figures 1b and 1c).

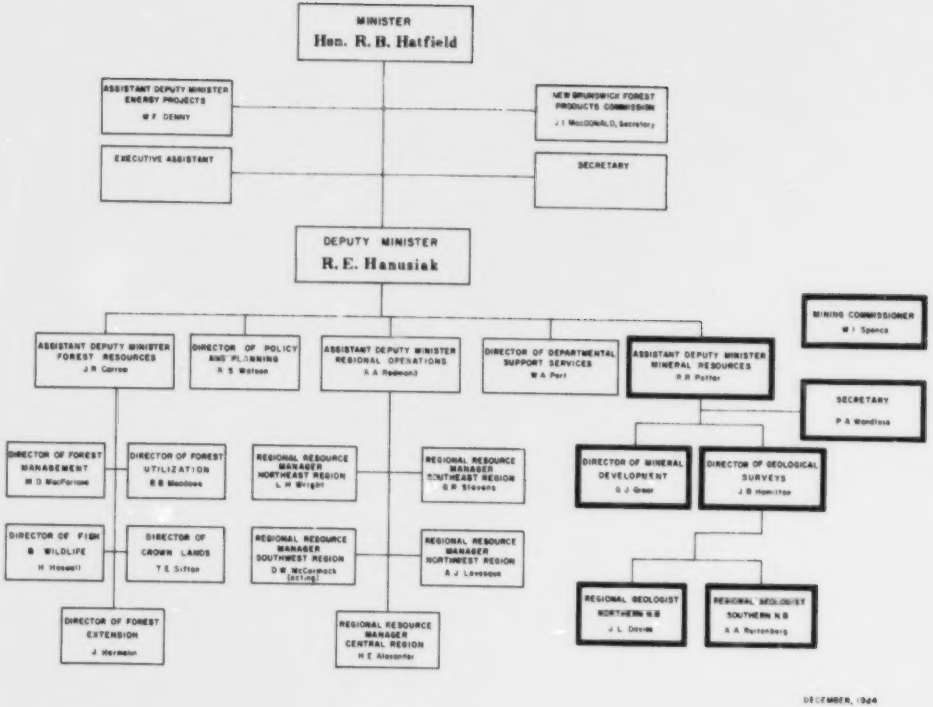

Figure 1a. Plan of organization, New Brunswick Department of Natural Resources.

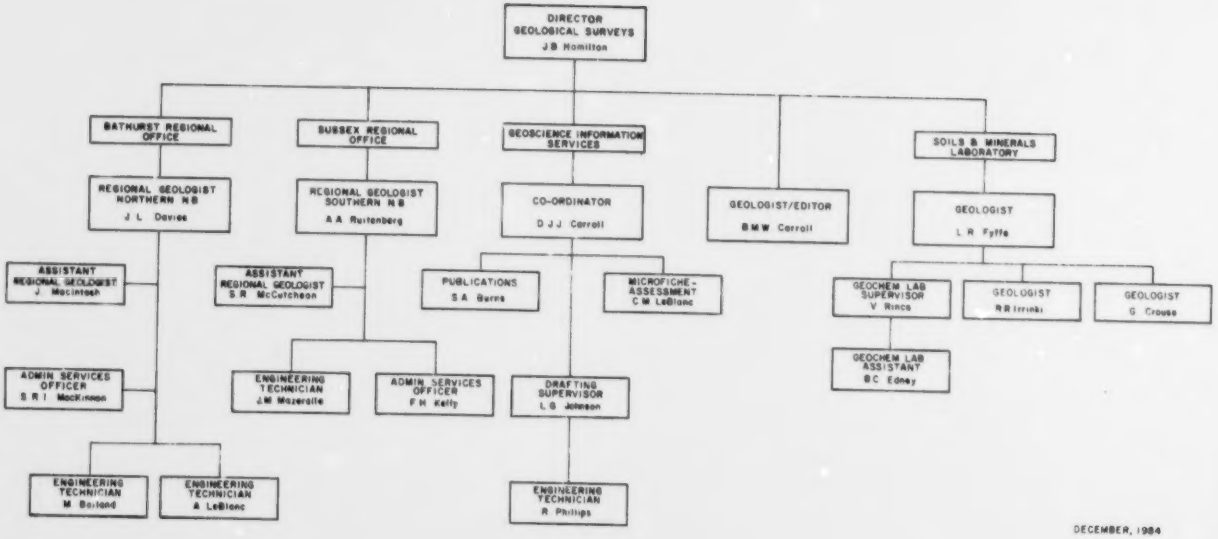

Figure 1b. Plan of organization, Geological Surveys Branch.

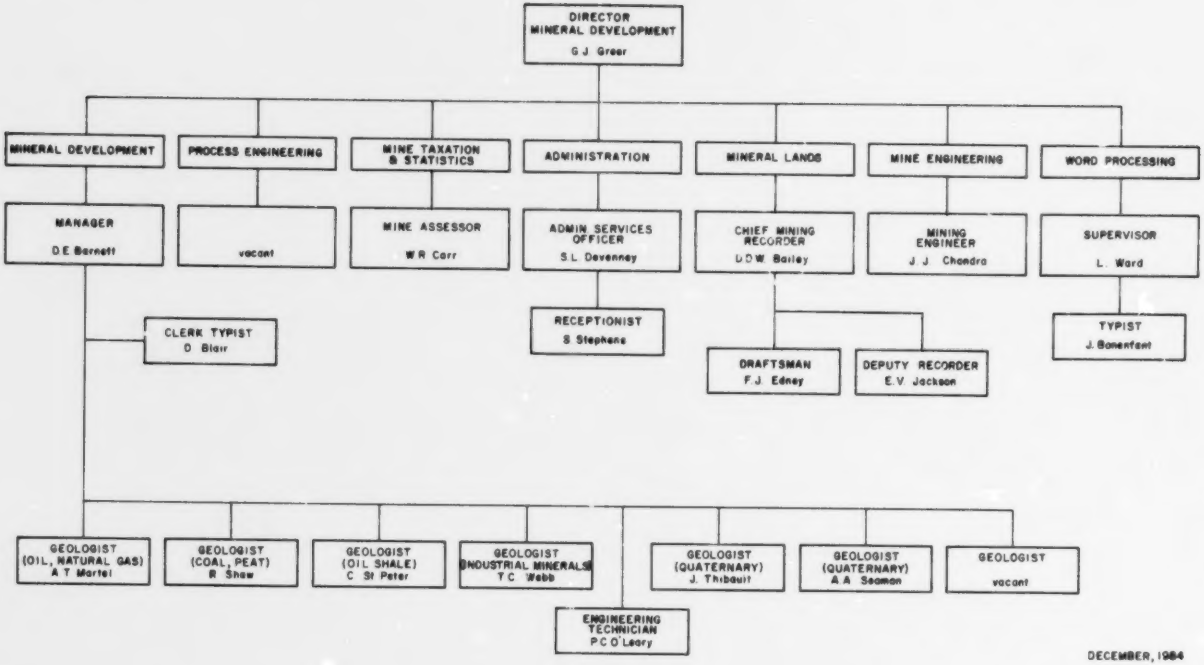

Figure 1c. Plan of organization, Mineral Development Branch.

GEOLOGICAL SURVEYS BRANCH[1]

The Geological Surveys Branch was formally established in 1980, although it may be said to have actually come into existence with the introduction of the Mining Act of 1927. In 1928, Dr. W.J. Wright was appointed Provincial Geologist. Shortly after, and over the years, he initiated many of the functions that have become the responsibility of the Geological Surveys Branch. The rather rigid distinction that existed in the early days between the roles of the Geological Survey of Canada, the 'University' and the Provincial Government with respect to mineral resource studies has been blurred in recent years. Formerly, the Geological Survey of Canada tended to restrict its activities to regional matters, the 'University' to academic matters and the Department of Natural Resources to economic geology, mine safety and resource administration. With the increasing importance of mineral resources to the provincial economy, and the changing geoscientific priorities of the Geological Survey of Canada, the Department of Lands and Mines (since renamed Department of Natural Resources) responded by expanding the scope of its activities beyond its traditional role. In the mid-sixties, using provincial funds, and through the hiring of technical specialists, introducing basic data-gathering projects, establishing regional geological offices, etc., the Mines Division was able to meet the added responsibilities that had first arisen out of the finds in the Bathurst-Newcastle camp a decade or so earlier. The resulting geological effulgence accompanying the Departmental reorganization of 1965 dominated the activities of the Mineral Resources Division throughout the seventies and early eighties. It was a period in which the effects of Federal-Provincial minerals agreements overshadowed all other activities of the Division. In fact, these agreements moulded the organization and its present-day character is derived, in no small part, from that heritage.

The prime responsibility of the Geological Surveys Branch is for the collection and dissemination of information concerning all aspects of New Brunswick's geology, and encouragement of exploration, discovery and the optimum development of mineral deposits. This role is particularly useful to those engaged in developing the mineral industry of the province, but it is also highly significant to those who must develop sound resource policies and plan the use of land. Although most of the information gathered by the Geological Surveys Branch is primarily used for mineral exploration, knowledge of geology is increasingly being used as a basis for land-use planning, environmental assessment, groundwater resource studies and engineering purposes. The overall objectives of the Branch are to provide a complete, up-to-date and comprehensive inventory to stimulate exploration and facilitate sound planning in all matters related to mineral and earth resources. Special emphasis is placed on:

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1 Written by Dr. R.R. Potter, Assistant Deputy Minister.

Collecting and disseminating geoscience information and identifying potential mineral resource areas.

Maintaining and providing comprehensive information about the nature, extent and amount of New Brunswick's known mineral deposits.

Identifying and analysing geological features and processes affecting land use, urban development, etc.

Encouraging and promoting public understanding and participation in mineral exploration by providing information about geology and mineral prospecting to the general public.

Regular field projects carried out by the Geological Surveys Branch were continued in 1984. Structural, stratigraphic, and mineralogical studies were carried out in areas of high mineral potential in the northern and southern parts of the Province. Work also continued on the geochemical (stream sediment) programme. Special projects included mineral deposit studies, earthquake investigations, regolith mapping, the Geological Highway Map of New Brunswick and Prince Edward Island, drill core storage, geoscience data management, prospecting courses, and displays.

On June 29, 1984, the Canada-New Brunswick Subsidiary Agreement on Mineral Development was signed. Under the agreement, $22.3 million will be spent on both geoscience and mineral technology programmes over a five-year period. As this agreement was signed late in the field season, only a small amount of work was completed in the 1984-85 fiscal year.

Bathurst Regional Office[1]

The staff of the Bathurst Regional Office consists of J.L. Davies (Regional Geologist), J.A. MacIntosh (Assistant Regional Geologist), Sharon McKinnon (Administrative Services Officer), Maurice Belland and André LeBlanc (Engineering Technicians).

PROGRAMMES Geological mapping continued on the 0-9 map area by J.A. MacIntosh. Field work is now complete, and the map is nearing completion.

J.L. Davies continued his study of gold occurrences and has prepared a paper describing those located in northern New Brunswick. The findings of this project will be in part reported by Ruitenberg and Davies (1985) at the G.A.C. Annual Meeting to be held in Fredericton in May 1985.

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1 Written by J.L. Davies

R.R. Irrinki and G. Crouse began a mineral inventory project which entails the compilation of all data available on the undeveloped massive sulphide deposits of the Bathurst-Newcastle area. The owners of the deposits were asked to provide their information so that the Mineral Resources Division could make grade and tonnage calculations. Most companies have complied with the Minister's request. Work on the Stratmat deposit, the first to be studied, will be completed by 1985, and the project will continue with the Key Anacon and Murray Brook deposits.

A stream silt survey was carried out in the east half of the California Lake (21 O/8) area. The contract for this survey was awarded to 3D GeoConsultants Limited. Due to budget cuts, the 1983 silt surveys in Madawaska County were still unpublished in 1984. It is hoped that the results of both surveys will be released in 1985.

The ERDA agreement was signed with the Federal government in 1984, but too late to initiate many projects in 1984-85. The five-year program entails (1) geological mapping (1:5,000, 1:10,000) in small areas of high mineral potential, and regional mapping (1:50,000) in the northwestern part of the Province, (2) regional silt sampling surveys in northwestern N.B., and (3) compilation of all geoscientific data in the Bathurst-Newcastle area (nine 1:50,000 N.T.S. map areas).

The geocompilation project was begun by establishing the procedures and symbology to be used. Maritime Resource Management Service Inc. was contracted to prepare 25 base maps (1:10,000) for 21 O/8, and it is expected these will be available in 1985.

CORE STORAGE Brunswick Mining and Smelting Corporation Limited disposed of some 80,000 feet (24000 m) of drill core from their No. 6 property, and offered most of it to the Bathurst Regional Office. Due to shortage of manpower and space, only a fraction of this core (20,000 feet or 6096 m) was taken into temporary storage at Madran.

OTHER ACTIVITIES Revisions of several previously published quarter-mile-series geology maps continues. Compilation of 1:50,000 geology maps mentioned in Information Circular 84-1 are largely complete.

Nearly 180 mineral occurrences have been identified in northern New Brunswick. The details regarding several of these deposits are rather sketchy, but an effort will be made in 1985 to gather more data and determine their significance in the overall metallogenic picture.

The Regional Geologist again reviewed forestry plans for northern New Brunswick, so that potential conflicts between mineral exploration and wood cutting operations could be avoided.

A field guidebook was prepared by the Regional Geologist for the 1985 GAC-MAC field tour of the Bathurst-Newcastle area.

A paper dealing with massive sulphide deposits of northern New Brunswick has been written for the Decade of North American Geology (DNAG) volume.

Sussex Regional Office[1]

The Sussex Regional Office staff consists of A.A. Ruitenberg (Regional Geologist), S.R. McCutcheon (Assistant Regional Geologist); M.R. Mazerolle (Engineering Technician) and F.H. Kelly (Administrative Services Officer).

PROGRAMMES AND PROJECTS Field programs were continued in the Bay of Fundy gold-bearing zone. S.R. McCutcheon conducted detailed geological mapping in the Lorneville-Lepreau area. A.A. Ruitenberg continued detailed geologic investigations of the Cape Spencer-Black River area. A till mapping and geochemical survey was conducted in this area by A.G. Pronk. J.A.R. Sterling, of the New Brunswick Research and Productivity Council, investigated the mineralogy of Cape Spencer ores.

S.R. McCutcheon measured type sections and sampled in the Mount Pleasant Caldera. Observations made on a fieldtrip to two recent calderas, in eastern California and western Nevada, are being used to assist in interpreting the complex geologic history of the Mount Pleasant Caldera.

Rock samples were collected from the western, central and eastern volcanic belts of the Coldbrook Group for trace element geochemical analysis to be done by J. Dostal of St. Marys University. Sites were also visited and described for the geological highways map of New Brunswick and Prince Edward Island.

A.A. Ruitenberg attended a field trip to recently discovered tin occurrences in the Dungarvon area of central New Brunswick. In cooperation with L.R. Fyffe, drill cores of the Long Lake deposit in northern New Brunswick were investigated. These investigations are part of a long-term metallogenic study of the New Brunswick mineral deposits.

L.R. Fyffe and A.A. Ruitenberg were invited to a field trip in the Caledonides of the United Kingdom, which was sponsored by I.G.C.P. and NATO. It was particularly instructive to examine well-exposed Early Paleozoic stratigraphic sections and mineral deposits in Wales and southern Scotland, which have geologic environments nearly identical to New Brunswick.

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1 Written by A.A. Ruitenberg.

A field trip to the gold-bearing rocks in the Bay of Fundy area and the Annidale Copper Prospect was provided for recent graduates of the prospecting course sponsored by the Geological Surveys Branch. Other field trips were given for mineral deposits geologists visiting New Brunswick and student groups from various universities.

Consultations were provided for numerous geologists, prospectors and engineers during the year. The main interest was in gold deposits. Geologic advice also was extended to foresters involved in forest site classification in the province.

A.A. Ruitenberg gave two papers at the Geological Association of Canada Annual Meeting in London, Ontario: 1) Gold-bearing Structures in the Bay of Fundy Coastal Zone, and 2) Soil Geology and Forest Productivity in New Brunswick. A field trip associated with the conference, to the classical gold and silver mining camps in the Kirkland Lake and Cobalt areas, also was attended.

S.R. McCutcheon, B.V. Roulston and T.C. Webb prepared a field guide on the Windsor Group and associated potash deposits. A.A. Ruitenberg and S.R. McCutcheon prepared field guides on tungsten-molybdenum-tin deposits in central and southwestern New Brunswick and gold deposits along the Bay of Fundy coast. All three field guides are being published by the University of New Brunswick for the 1985 Geological Association of Canada Annual Meeting in Fredericton. A special session on mineral deposits related to tectonic evolution of New Brunswick also was organized for the 1985 GAC Annual Meeting. A.A. Ruitenberg, S.R. McCutcheon and J. Thibault also prepared a field guide to geomorphologic districts and regolith systems in New Brunswick for incorporation in a preliminary forest site classification manual.

S.R. McCutcheon prepared a summary of the regional geology of southern New Brunswick for the Decade of North American Geology volumes (DNAG). A summary of the geology of potash deposits in New Brunswick also was prepared for DNAG.

Geologic maps of the Annidale-Nerepis area (scale 1:50,000) by S.R. McCutcheon and A.A. Ruitenberg were finalized for printing by Maritime Resource Management Service Inc. Final editorial corrections were also made on a memoir to accompany these maps. A report on the engineering geology of the Point Lepreau area was reviewed at the request of Maritime Nuclear.

D.W. Hattie was engaged in setting up a mineral occurrence file and compilation of a metallogenic map of New Brunswick. A small-scale version of this map will be incorporated in a metallogenic map of the American and Canadian Appalachians.

Exhibits on the mineral deposits of the region were prepared for the annual Review of Activities in Fredericton

and the Prospectors and Developers Association meeting in Toronto.

PUBLICATIONS

McCutcheon, S.R. and Ruitenberg, A.A. 1984. Saint John, Annidale-Nerepis area. Scale 1:50,000. Geological Surveys Branch, New Brunswick Department of Natural Resources and Canada Department of Regional Economic Expansion, Plate 84-1.

_____ 1984. Hampstead, Annidale-Nerepis area. Scale 1:50,000. Geological Surveys Branch, New Brunswick Department of Natural Resources and Canada Department of Regional Economic Expansion, Plate 84-2.

_____ 1984. Codys, Annidale-Nerepis area. Scale 1:50,000. Geological Surveys Branch, New Brunswick Department of Natural Resources and Canada Department of Regional Economic Expansion, Plate 84-3.

_____ 1984. Sussex, Annidale-Nerepis area. Scale 1:50,000. Geological Surveys Branch, New Brunswick Department of Natural Resources and Canada Department of Regional Economic Expansion, Plate 84-4.

McCutcheon, S.R. 1984. Geologic sections - Annidale-Nerepis area (to accompany Annidale-Nerepis area geologic maps). Scale 1:50,000. Geological Surveys Branch, New Brunswick Department of Natural Resources and Canada Department of Regional Economic Expansion. Plate 84-5.

_____ 1984. A dissected Mississippian Caldera in southwestern New Brunswick. Abstract, Atlantic Geoscience Society Annual Meeting, p. 23.

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Ruitenberg, A.A. and McCutcheon, S.R. 1984. Soil geology and forest productivity in New Brunswick. Abstract, Geological Association of Canada Annual Meeting, London, Ontario.

Ruitenberg, A.A., McCutcheon, S.R. and Thibault, J. 1984. Field guide to geomorphologic districts and regolith systems in New Brunswick. In Preliminary Field Guide to Forest Site Classification in New Brunswick. N.B. Forest Site Classification Council, p. 2.1-2.14 and 3.1-3.19.

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Ruitenberg, A.A. and Pronk, A.G. 1984. Geology and mineralogy of gold deposits in the Cape Spencer-Black River area. In Ninth Annual Review of Activities, Project Resumes 1984. Edited by B.M.W. Carroll. New Brunswick Department of Natural Resources, Mineral Resources Division, Information Circular 84-2, pp. 7-14.

Soils and Minerals Laboratory[1]

Geological Surveys Branch staff at the Soils and Minerals Laboratory include L.R. Fyffe, R.R. Irrinki, G. Crouse (Geologists); V. Rinco (Geochemistry Laboratory Supervisor); and B.C. Edney (Geochemistry Laboratory Assistant).

GEOLOGY The results of the 1983 project in central New Brunswick by L.R. Fyffe and A.G. Pronk have been published in Report of Investigation No. 20, 'Bedrock and surficial geology-rock and till geochemistry in the Trousers Lake area, Victoria County, New Brunswick'. A field guide entitled 'Stratigraphy and structure of the Ordovician, Silurian and Devonian of northern New Brunswick' by L.R. Fyffe and J.P.A. Noble has been published for the Joint Annual Meeting of the GAC/MAC to be held in Fredericton in May, 1985. Geological site descriptions entitled 'Stratigraphy and tectonic setting of Ordovician rocks in the Bathurst area of northeastern New Brunswick' have been submitted for inclusion in a centennial field guide project of the Northeastern Section of the GSA. Editing has been completed on the New Brunswick stratigraphic descriptions by L.R. Fyffe and S.R. McCutcheon to be published by the Canadian Society of Petroleum Geologists in their 'Lexicon of Canadian stratigraphy, Volume VI, Atlantic Canada'.

Site descriptions and panels have been prepared by Mineral Resources staff, the University of New Brunswick, and Mount Allison University for the 'Geological highways map of New Brunswick and Prince Edward Island'. The project was initiated by the Atlantic Geoscience Society and will be published in English and French. The colour plates have been prepared by MRMS in Amherst, N.S. and will be printed in May, 1985.

A paper entitled 'Petrochemistry and tectonic significance of Carboniferous volcanics in New Brunswick' was presented by L.R. Fyffe at the Atlantic Geoscience Society Symposium in Wolfville, N.S. and will be the subject of a forthcoming publication. In addition, Silurian and Devonian volcanic samples collected in northern New Brunswick during previous provincial mapping projects have been analysed at Saint Marys University.

In September, 1984, a field trip to central New Brunswick was organized at the request of the New Brunswick Prospectors and Developers Association. The geology of the Mount Costigan breccia pipe was outlined by M. Crevier of Lac Minerals Ltd.

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1 Written by L.R. Fyffe and V. Rinco.

and L.R. Fyffe described the sulphide and uranium mineralization in the Long Lake area. L.R. Fyffe attended a three week combination field trip and geological conference in late August, 1984, to Great Britain as part of an International Geological Correlation Program sponsored by UNESCO and financed by NATO. Ordovician volcanics in Wales, Precambrian rocks in Anglesey, and thrust slices in northern Scotland were examined.

GEOCHEMISTRY In 1983, a total of 2,194 stream silt samples were collected from map sheets 21 N/8 (Edmundston), 21 N/7 (Lac Baker), 21 N/2 (Connors), and 21 N/6 (Estcourt) by 3D Geo Consultants. Samples were analysed for Cu, Pb, Zn, Mn, Fe, Ag, Co, and Ni by atomic absorption, Mo and W by colorimetry, and U by neutron activation (Table 1). In addition, 260 till samples submitted by A. Seaman and J. Thibault, and 1,285 core samples were analysed for the same elements; 766 till samples from A. Ruitenberg were analysed for Cu, Pb, Zn, and Ag, and were sent to a commercial laboratory for analyses of Au and As.

The Geological Survey of Canada provided stream and lake sediment samples that will be used as international reference materials. These 16 samples were analysed five times each by atomic absorption for the previously mentioned eight elements, and by colorimetry for Mo, W, and V.

The atomic absorption method: Samples of 1 g were digested with hot nitric acid and the clear liquid introduced as an aerosol into the air-acetylene flame of the Perkin-Elmer Atomic Absorption Instrument (Model 503). The measured absorbance for each element was compared to prepared standards and the element content determined in parts per million as described in the Perkin-Elmer Atomic Absorption Model 503 manuals (1976).

The colorimetric method: sample weights of 0.25 g for Mo and 0.5 g for W were fused with potassium hydrogen sulphate and leached with hydrochloric acid. A color complex of molybdenum (tungsten)-dithiol of each sample was then compared with prepared standards as described in Analytical Methods for Use in Geochemical Exploration (R.E. Stanton, 1976).

Uranium analyses were done by the neutron activation method (delayed neutron counting) at the Atomic Energy of Canada Limited Commercial Products Division in Ottawa. When a sample containing U is bombarded with a neutron flux in a reactor, fission of the U occurs. Some of the fission-product nuclides emit delayed neutrons. The number of delayed neutrons emitted is a linear function of the amount of U present in the sample. Because the delayed neutrons can be detected and selectively counted, the total amount of U present in the sample can be readily determined by comparison to a standard reference material containing a known level of U (A.E.C.L., 1978).

TABLE 1.
Plate Numbers for 1:20,000 Map Sheets
(1983 Stream Silt Survey)

MAP SHEET	Plate numbers						
	STATIONS	Cu, Pb, Zn	Mn, Fe%	Ag, Co	Ni	Mo, W	U
21 O/3c	84-20a	84-8a	84-8b	84-8c	84-8d	84-8e	84-8f
21 O/3d	84-20b	84-9a	84-9b	84-9c	84-9d	84-9e	84-9f
21 O/3e	84-20c	84-10a	84-10b	84-10c	84-10d	84-10e	84-10f
21 O/3f	84-20d	84-11a	84-11b	84-11c	84-11d	84-11e	84-11f
21 O/6a	84-20e	84-12a	84-12b	84-12c	84-12d	84-12e	84-12f
21 O/6b	84-20f	84-13a	84-13b	84-13c	84-13d	84-13e	84-13f
21 O/6c	84-20g	84-14a	84-14b	84-14c	84-14d	84-14e	84-14f
21 O/6d	84-20h	84-15a	84-15b	84-15c	84-15d	84-15e	84-15f
21 O/6e	84-20i	84-16a	84-16b	84-16c	84-16d	84-16e	84-16f
21 O/6f	84-20j	84-17a	84-17b	84-17c	84-17d	84-17e	84-17f
21 O/6g	84-20k	84-18a	84-18b	84-18c	84-18d	84-18e	84-18f
21 O/6h	84-20m	84-19a	84-19b	84-19c	84-19d	84-19e	84-19f

A report titled 'In-house computerization of geochemical data' was prepared and published as Open File Report 84-1. Using programs described therein, all geochemical data was digitized, keypunched into a computer, files edited, and maps printed by the Zeta plotter at the UNB Computer Centre. Each 1:20,000 map was plotted 6 times with elements in the following groups: Cu, Pb, Zn; Mn, Fe; Ag, Co; Ni; Mo, W; U. Maps have been sent to Bathurst to be drafted.

In November, 1984, Valeria Rinco attended a two-day seminar given by J.T. Baker Chemical Co. in Toronto, titled 'Hazardous chemicals safety'.

Geoscience Information Services Section[1]

Geoscience Information Services section of the Geological Surveys Branch consists of the following staff members: D.J.J. Carroll (Coordinator), L.G. Johnson (Drafting Supervisor), R.E. Phillips (Engineering Technician), S.A. Burns (Publications), C.M. LeBlanc (Microfiche/Assessment Files).

PROSPECTING COURSES One prospecting course was offered by the Geological Surveys Branch in 1984. This introductory course, which consisted of 10 evening sessions, was given in three locations: Saint John, Moncton, and Fredericton. Due to the increase in number of registrants in the Fredericton area, a second session was offered. A total of 86 people signed up for the 1984 introductory prospecting course.

As in previous years, a field trip conducted by Dr. A.A. Ruitenberg, Regional Geologist for southern New Brunswick, was given to those interested students. This year's trip included the Cape Spencer gold and Annidale copper prospects. Seventeen students attended the trip.

In addition to the introductory prospecting course, a one-day seminar entitled 'Prospecting in New Brunswick' was held on November 25, 1984 in conjunction with Mineral Resources Division's annual Review of Activities. Mr. P. Dimmel, representing the Prospectors and Developers Association of New Brunswick, spoke on the topic of geochemical and geophysical prospecting; Dr. J.L. Davies, Regional Geologist for northern New Brunswick, spoke on prospecting in northern New Brunswick; while Dr. A.A. Ruitenberg, Regional Geologist for southern New Brunswick, spoke on prospecting in southern New Brunswick. Twenty-one former prospecting students attended this seminar.

The CBC documentary 'Hemlo gold' was shown in the evening for those attending the Review of Activities and associated events.

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1 Written by D.J.J. Carroll.

MICROFILMING OF MINERAL EXPLORATION ASSESSMENT FILE REPORTS In the 1984 calendar year, a total of 104 assessment file reports were received by the Mineral Lands section. These reports were microfilmed and duplicate copies of the resultant microfiche were forwarded to several libraries and the two regional offices of the Geological Surveys Branch.

Anyone wishing to obtain microfiche copies of the 1984 or earlier reports are requested to contact Precision Microfilm Services, 6100 Young Street, Halifax, N.S. B3K 2A4.

GEOSCAN BIBLIOGRAPHIC COMPUTER-BASED DATA FILE The Geoscience Information Services section continued to index and code all incoming exploration assessment reports for inclusion into the Geological Survey of Canada's data base called GEOSCAN. In addition, the indexing of Mineral Resources Division's published reports was commenced and by year's end seventy-five publications were added to our existing GEOSCAN complement of over 3,100 documents.

For the annual Review of Activities in November, a custom GEOSCAN index, sorted by N.T.S. was distributed to all registrants. This index included assessment file report data for the year 1983-84.

AUDIO-VISUAL PRODUCTS The Geoscience Information Services section maintains a library of audio-visual products related to the geological and mineral resource industry of the Province. Products, such as the 16 mm movie entitled 'The awakening giant', the 35 mm slide programs called 'The mineral industries of New Brunswick' and 'The peat industry of New Brunswick', are available on a loan basis. These audio-visual materials are regularly used by staff for various talks but are used also by university personnel and school teachers in New Brunswick and the State of Maine.

Anyone wishing to borrow these products are requested to contact Geoscience Information Services in Fredericton.

In addition to those products mentioned above, we also maintain and are developing a comprehensive library of 35 mm slide and negative film images. These images are frequently used by division staff, other government departments, provincial agencies concerned with education and mineral resources, and various mineral exploration/mining companies. Requests are also received from publishers of periodicals, trade journals, and newspapers.

PUBLIC AWARENESS During 1984 the Geoscience Information Services section produced and exhibited several displays that publicized the work of the Mineral Resources Division and/or the mineral resources of the Province, as well as the mineral industry of New Brunswick. These displays were used at such events as the Provincial Geological Display Room at the Prospectors and Developers Convention in Toronto, Hampton Spring Trade Show, Moncton Railroad Days' Expo East Exhibition, the Albert County Exhibition, the Moncton Museum,

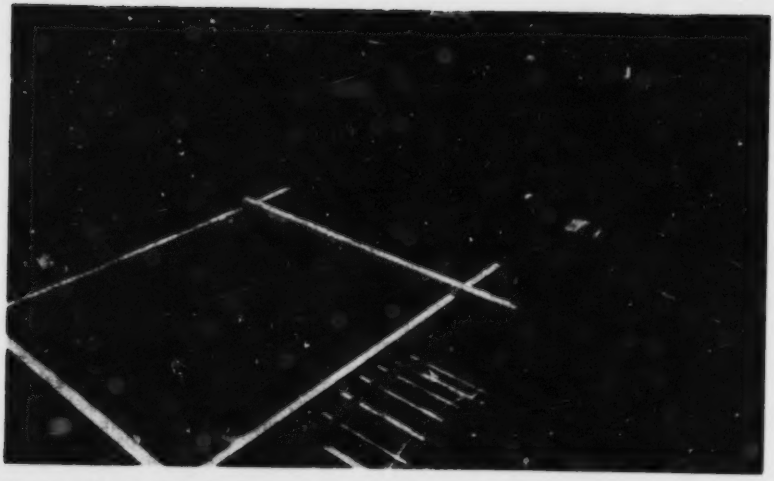

Figure 2. Mineral Resources Division mineral resources and mining display at Moncton Railroad Days' Expo East Exhibition.

Figure 3. J.B. Hamilton addressing the delegates at the technical session of the Review of Activities.

and at the Division's annual Review of Activities in Fredericton (figures 2 and 3).

Besides staff use of these displays, other associations and groups also borrowed display material. For example, the Saint John Regional Development Commission was provided assistance and material for a display highlighting the mineral resource industry in their region that was used at the Saint John Exhibition in September. The organizing committee of the 1985 GAC/MAC Fredericton Conference also borrowed display material for use at the 1984 Kingston GAC/MAC Conference to promote the following year's Fredericton Conference. Brunswick Mining and Smelting borrowed display products for use at Bathurst's Career Day Show.

PUBLICATION DISTRIBUTION The Geoscience Information Services section is the focal point for disseminating geological/mineral resource data, and in 1984 processed several hundred requests. Total revenue for the calendar year amounted to $21,774.00, representing the sale and distribution of over 5,200 publications to government and private industry.

MINERAL DEVELOPMENT BRANCH[1]

The Mineral Development Branch is composed of the Director's office and seven sectors: Mineral Development, Process Engineering, Mine Taxation and Statistics, Administration, Mineral Lands, Mine Engineering, and Word Processing. The Director is G.J. Greer.

The Mineral Development Branch's overall goals are to ensure that mineral deposits are developed at the optimum rate consistent with long-term income and employment objectives, to enhance the viability of marginally economic mineral deposits, to ensure that inactive mining operations are rehabilitated to a state which would avoid on-going costs to the public and, where possible can be economically productive in other uses, to ensure the highest degree of in-province processing and to maximize recovery both in the mining and primary processing stages (Figure 4).

Mineral Development Sector[2]

In June, 1984 the Energy Resouces Geologist, Donald Gemmell, left the Department and his duties were assumed by Donald Barnett. At this time, the Energy Resources section and Industrial Minerals section were combined to form the Mineral Development sector.

The staff of the Mineral Development sector includes Donald Barnett (Manager), Clinton St. Peter (Geologist, oil

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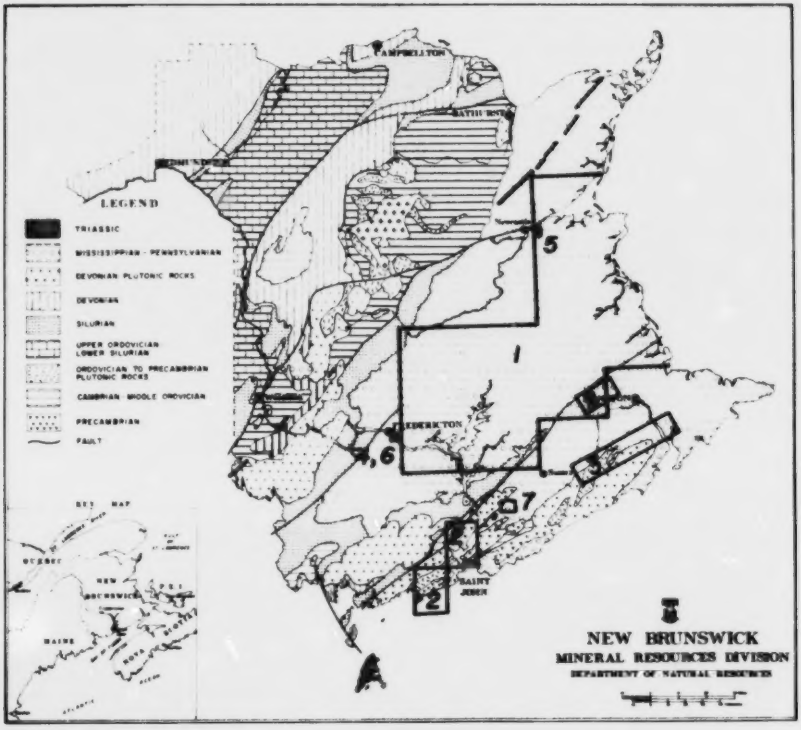
1 Written by G.J. Greer.
2 Written by D.E. Barnett.



1 Granular aggregate resources
2 Limestone studies, Havelock and Saint John areas
3 Albert oil shale compilation
4 Oil shale retorting research
5 Coal-oil shale combustion research
6 Manganese compilation
7 Potash at Millstream

Figure 4. Areas in which Mineral Development Projects were carried out in 1984.

shales), Ronald Shaw (Geologist, peat and coal) and A. Thomas Martel (Geologist, oil and natural gas), Timothy Webb (Geologist, industrial minerals), Jacques Thibault (Geologist, Quaternary and coastal zone), Allen Seaman (Geologist, Quaternary) and Paul O'Leary (Engineering Technician, quarriable substances).

OIL SHALES The Branch completed its economic field evaluation of the Albert Formation with the data being compiled and made ready for publication. Continuing research necessitated that all existing mineralogical and chemical data on the Albert oil shale and shale oil be compiled. This has been done and published as Open File Report 84-4.

Several government and industry representatives were given guided tours of the oil shale sites in Albert and Westmorland Counties.

The New Brunswick Research and Productivity Council (RPC) continued research on oil shales. RPC has successfully demonstrated that an oil shale retort can be interconnected with a fluidized-bed combustor and that the spent shale from the retort can be transferred to and burnt with high-sulphur coal in a fluidized bed. Traditionally, 30% of the energy value of the oil shale is lost in a retorted shale; however, in this system the additional energy is utilized by combustion and the carbonate minerals in the spent shale effectively capture the evolved undesirable SO_x gases from the coal.

Albert shale oil has been produced at RPC by both direct and indirect retorting. The oil has an overall quality better than the Green River shale oil of Colorado. It contains lower undesirable nitrogen and arsenic and higher hydrogen. Consequently, it will require less upgrading and appears to be a good feedstock for gasoline, kerosene, jet and diesel fuels.

In 1984 the fluidized-bed technology research at RPC resulted in the Federal government funding a $33 million conversion of the NBEPC 20 megawatt coal-burning Chatham Generating Station. Construction has begun on this demonstration facility which will be tested from 1986 to 1988. It is expected that the plant will be run-in for about 3,000 hours and will require 40,000 to 50,000 tonnes of oil shale.

COAL In keeping with the Provincial Coal Policy, an Exploration Block was offered to N.B. Power. The 60-day first right of refusal was not optioned and as a result, the area was offered to the public. Tenders were not received on this Exploration Block, even though the area was tendered as the result of a request from the public.

The Branch continued to participate on various committees charged with duties from determining the beneficiation potential of Eastern Canadian coals to recommending direction for Canadian coal research and development.

PIPELINE AND UNDERGROUND STORAGE Two pipeline corridor routes, proposed by Mobil Oil Canada Ltd. and Sable Gas Systems for transportation of natural gas from the 'Venture Field' off Nova Scotia, were reviewed for impacts on other resources. These reviews were preliminary and in advance of each company submitting applications to the National Energy Board.

OIL AND NATURAL GAS An in-house study of the seismic data shot in and around the Cumberland Subbasin was carried out.

Compilation and field check of all recorded bitumen showings in the Province was completed and a more detailed study of the nature of these showings is still in progress.

The Escuminac Formation in the Baie des Chaleurs region was studied in order to assess its potential for hydrocarbon generation and entrapment. This study will continue in 1985.

Three road and stream sections of the Albert Formation were mapped in detail to try and discern the variation in porosity and cementing with the subenvironments of each depositional system.

AGGREGATE RESOURCE INVENTORY The program of granular aggregate resource mapping and evaluation continued in 1984. Mapping was at a reconnaissance level on N.T.S. Map Sheets 21 G/16, 21 H/13, 21 I/3, 21 I/4, 21 I/5, 21 I/6, 21 I/7, 21 I/10, 21 I/11, 21 I/14, 21 I/15, 21 P/2, 21 P/3, 21 J/1, and 21 J/8 at a scale of 1:50,000 (Figure 5).

QUATERNARY GEOLOGY Work on the Quaternary geology compilation of New Brunswick was completed in 1984 and published as Geological Survey of Canada, Memoir 416 under the authorship of V.N. Rampton, R.C. Gauthier, J. Thibault, and A.A. Seaman.

POTASH Programs continued for the monitoring of potash developments at Potash Company of America (Plumweseep), Denison-Potacan Potash Company (Clover Hill) and BP Resources Canada Ltd. (Lower Millstream). Included in this work was the preparation of a final in-house report concerning BP's recently completed exploration program near Lower Millstream. The report incorporated and summarized the results of 11 drill holes, as well as related geologic and geophysical investigations.

A preliminary unpublished report considering the future potash potential of the province was also completed.

LIMESTONE A detailed study involving a reexamination and reassessment of the Province's limestone resources and a synopsis of various aspects related to the limestone industry continued in 1984.

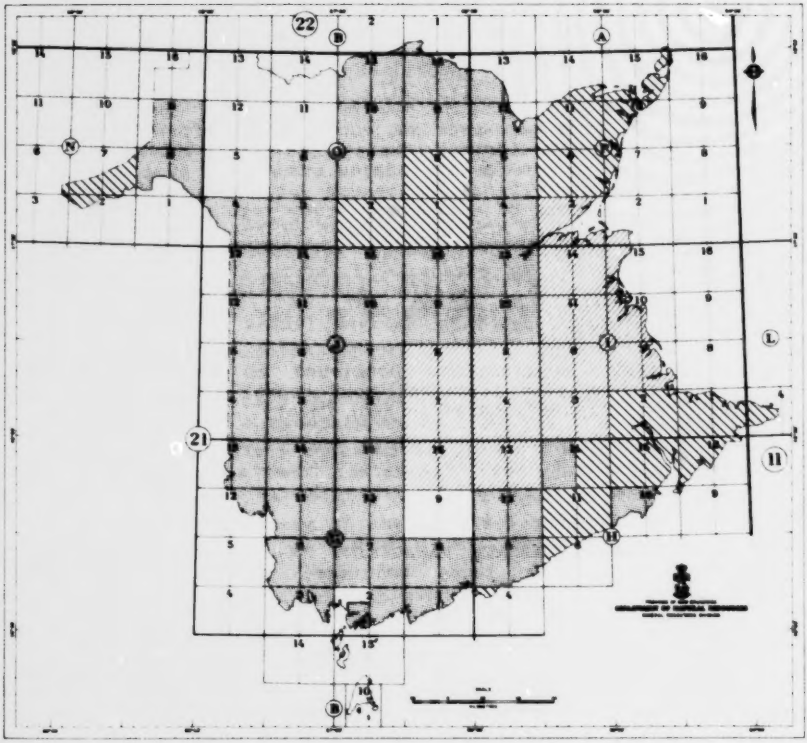


Figure 5. Aggregate resource inventory in New Brunswick, 1984.

In New Brunswick, the majority of our better quality limestones and dolomites are found principally in rocks of Precambrian, Silurian and Mississippian age, although a few occurrences have been recently noted in Ordovician rocks as well. To date, field reconnaissance involving mapping and sampling of over 500 occurrences has been completed and data compilation on individual deposits has been accelerated.

MANGANESE An unpublished report summarizing information concerning some fifty-nine (59) reported occurrences of manganese mineralization in New Brunswick was completed. The majority of these have been subjected to some form of periodic exploration or development during the last 100 years. The objective was to provide an updated summary of available facts and figures on various manganese occurrences within the Province in support of a proposed study into manganese markets by the Government of Canada, as part of their contribution to the recent Mineral Development Agreement signed with the Province in 1984. An extensive literature search was undertaken, resulting in a detailed and comprehensive compilation of manganese-related information on file within the Mineral Resources Division.

PEAT Applications continued to be received for Peatland Exploration Licences. Most recent interest has been shown for peatlands located in Kent County.

The Branch continued to support efforts to promote an industry-oriented peat research centre established in Shippagan and affiliated with Centre Universitaire de Shippagan.

CROWN AGGREGATE MANAGEMENT Management of aggregate resources on Crown lands continued under the Quarriable Substances Act.

A total of 316 quarry permits were issued during the year, representing an increase of 14% over the previous year. Quarry leases in effect in 1984 included those to Brunswick Mining and Smelting Corporation Ltd., Elmtree Resources Ltd., Dundee Cement Products Ltd., Brunswick Ready Mix Concrete Ltd., and Heath Steele Mines Ltd. covering a total area of 481 ha.

Quarry permit and lease sites were inspected during the year to ensure that regulations under each were adhered to. A total of 2.26 million tonnes of sand, gravel and stone were removed from Crown lands and designated areas compared to 1.21 million tonnes in 1983.

PUBLICATIONS

Barnett, D.E. 1984. Potash Production in New Brunswick, Fertilizer International, No. 186, September 6, 1984.

Rampton, V.N., Gauthier, R.C., Thibault, J. and Seaman A.A., 1984. Quaternary Geology of New Brunswick. Geological Survey of Canada, Memoir 416.

St. Peter, C. 1984. Mineralogical and Chemical Data of Albert Formation Oil Shale. Department of Natural Resources, Mineral Resources Division, Open File Report 84-4.

Thibault, J. 1984. Surficial Deposits of Part of the Fredericton Junction (21 G/10) and McDougall Lake (21 G/7) map areas. Department of Natural Resources, Mineral Resources Division, Open File Report 83-14.

Reclamation[1]

Twenty-eight hectares (70 acres) of reclamation work, involving both contouring and revegetation, was carried out at the mine sites in northern New Brunswick in 1984. The seed mixtures used in revegetation were commonly composed of Leo Bird's-foot Trefoil, K31 Tall Fescue and Canada #1 Creeping Red Fescue. The actual success of revegetation efforts will not be evident until the vegetation has proved to be self-sustaining.

Approximately 162 ha (400 acres) of mined lands were contoured in the Minto-Chipman coal mining region during the year. As well, grass test plots were established at Albrights Corner and clover and oats were planted at a contoured section near Coal Creek.

An inventory survey of the pre-1977 mined lands was also carried out during the summer and fall of 1984 in the Minto-Chipman region.

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1 Written by G.J. Greer.

Administration Section[1]

The operating budget for the Mineral Resources Division for the fiscal year 1984-85 amounted to $2,083,396 which represented a 2% increase over the previous year (Table 2). Table 3 represents a historical review of expenditures, staff and revenue.

Details of the staffing of the Mineral Resources Division are given in Figures 1a, 1b, 1c and Table 4.

The section is staffed as follows: Sandy DeVenney (Administrative Services Officer), and Shelley Stephens (Receptionist).

TABLE 2

Provincial Budget, 1984-85

Primary	Budget	Expenditures	Differences (over) or under
3	$1,389,526.00	$1,340,220.85	$ 49,305.15
4	427,870.00	481,586.45	(53,716.45)
5	240,500.00	83,350.40	157,149.60
6	25,500.00	46,869.70	(21,369.70)
8	-	6,183.72	(6,183.72)
	$2,083,396.00	$1,958,211.12	$125,184.88

The Division's budget was underspent in Primaries 3 and 5 and overspent in Primaries 4, 6 and 8. The large underexpenditure is broken down as follows:

$50,000	-	not in Mineral Resources control
$49,306	-	2 vacant positions
$99,306		

Actual underexpenditure $25,878.88.

The year 1984 saw the beginning of the Mineral Development Subsidiary Agreement (Table 5).

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1 Written by S.L. DeVenney.

Table 3.
Mineral Resources Division
Budgeted Amounts, Revenue, Staff
1965-1984

Year	Budget Provincial	Expenditures Provincial	Federal/ Provincial Agreement Budget	Federal/ Provincial Agreement Expenditures	Total Revenue	Staff		
						Permanent	Casual	Total
1965-66	$ 274,663	$ 274,663	$ -	$ -	$ 908,502	24	-	24
1966-67	329,292	329,292	-	-	563,404	26	-	26
1967-68	381,478	381,478	-	-	278,464	27	-	27
1968-69	341,671	341,671	-	-	292,257	28	-	28
1969-70	321,162	321,162	-	-	417,949	25	-	25
1970-71	626,289	626,289	-	-	319,278	27	13	40
1971-72	798,274	798,274	-	-	303,030	29	13	42
1972-73	904,673	904,673	-	-	233,525	29	13	42
1973-74	1,527,020	1,527,020	-	-	592,550	29	13	42
1974-75	1,384,312	1,384,312	-	-	2,165,711	30	13	43
1975-76	1,354,593	1,354,593	-	-	2,561,458	30	13	43
1976-77	1,041,180	1,041,180	1,054,678	798,685	863,888	30	13	43
1977-78	972,122	972,122	2,814,775	2,004,378	1,135,828	29	14	43
1978-79	1,065,817	1,065,817	2,529,298	2,167,641	3,040,492	31	12	43
1979-80	957,996	957,996	1,705,158	1,492,199	10,736,752	36	12	48
1980-81	967,895	967,895	1,504,388	1,239,714	8,127,201	38	10	48
1981-82	1,164,651	1,164,651	1,877,815	1,368,202	7,807,912	39	10	49
1982-83	1,926,022	1,926,022	475,224	434,089	5,553,900	43	4	47
1983-84	2,041,300	2,028,442	26,024	26,024	5,175,989	44	3	47
1984-85 (P)	2,083,396	1,958,215	331,000	78,549	7,160,921	44	3	47

Table 4.
Staff of Mineral Resources Division 1953-1984

Year	Mines or Mineral Development						Mineral Resources or Geological Surveys						Total Division
	Admin	Geologist Mining Eng	Tech	Steno Secty	Draft	Total	Admin	Geologist Mining Eng	Tech	Steno Secty	Draft	Total	
1953-54	1	1	1	3	-	6							6
1954-55	2	1	1	4	-	8							8
1955-56	4	-	3	6	2	15							15
1956-57	4	-	3	8	2	17							17
1957-58	5	1	2	9	2	19							19
1958-59	5	1	2	9	2	19							19
1959-60	5	1	4	10	1	21		INCLUDES MINERAL LANDS					21
1960-61	5	1	3	10	1	20							20
1961-62	5	1	2	10	2	20							20
1962-63	5	1	2	11	2	21							21
1963-64	5	1	2	10	2	20							20
1964-65	5	2	2	9	2	20							20
1965-66	5	6	3	8	2	24							24
1966-67	5	8	3	8	2	26							26
1967-68	2	-	3	-	-	5	3	9	1	7	2	22	27
1968-69	2	-	3	-	-	5	3	10	1	7	2	23	28
1969-70	2	-	3	-	-	5	3	7	1	6	3	20	25
1970-71	3	-	2	-	-	5	3	7	4	5	3	22	27
1971-72	3	-	2	-	-	5	3	7	4	5	3	22	27
1972-73	3	-	3	-	-	6	3	8	4	5	3	23	29
1973-74	3	-	3	-	-	6	3	8	4	5	3	23	29
1974-75	3	-	3	-	-	6	4	8	3	6	3	24	30
1975-76	3	-	4	-	-	7	4	8	2	6	3	23	30
1976-77	3	-	4	-	-	7	4	8	2	6	3	23	30
1977-78	4	-	6	-	-	10	2	8	2	4	3	19	29
1978-79	2	-	5	-	-	7	4	9	3	5	3	24	31
1979-80	-	-	-	-	-	-	4	13	6	8	3	34	34
1980-81	-	-	-	-	-	-	8	13	6	8	3	38	38
1981-82	2	6	1	1	-	10	6	8	7	6	2	29	39
1982-83	5	8	1	3	1	18	5	9	6	4	1	25	43
1983-84	6	8	3	5	2	24	6	8	4	1	-	19	43
1984-85	6	10	1	3	1	21	5	10	6	1	1	23	44

TABLE 5

Mineral Development Agreement, 1984-85

Budget	Expenditure	Balance
(P) $331,000.00	$78,548.49	$252,451.51

A historical summary of Mineral Resources Division budgets, for provincial and federal projects, is presented in figure 6.

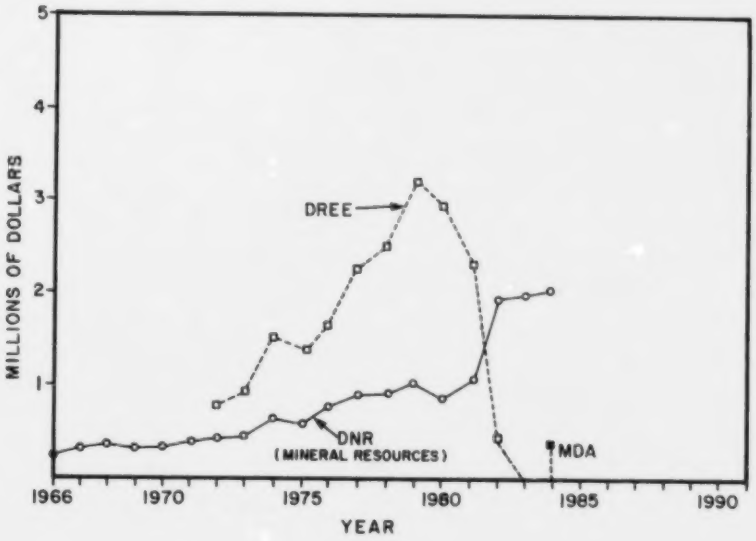

Figure 6. Budget of Mineral Resources Division 1966-1984.

Mineral Lands Section[1]

The Mineral Lands Section processes and maintains records pertaining to the disposition of Crown-owned minerals. Mining claims are recorded and prospecting licences are sold at Fredericton and the Regional Offices at Bathurst and Sussex.

The Mineral Lands staff consists of D.D.W. Bailey (Chief Mining Recorder), E.V. Jackson (Deputy Recorder), and Fred Edney (Draftsman).

Table 6 presents mineral lands statistics for 1984. The number of claims staked in each of the metallogenic zones is illustrated in figure 7 and the total annual expenditures reported for assessment credit (1954-1984) is given in figure 8.

Mine Taxation and Statistics[2]

With the retirement of E.K. Coughlan as Mine Assessor in November 1983, the position was assumed by W.R. Carr, on an acting basis in January 1984 and Carr was appointed to the position on 9th October 1984.

The active mines in the province submitted monthly statistical reports on production, manpower, shipments, etc. This information was compiled and distributed monthy. Reports were maintained on commodity prices, U.S. exchange rate, forecasted Capital expenditures, etc.

The tax returns for those mines subject to the Metallic Minerals Tax Act were reviewed and collection of revenue continued on a routine basis. Potash and coal royalties were collected on a regular basis. Revision of the Metallic Minerals Tax Act continued.

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1 Written by D.D.W. Bailey.
2 Written by W.R. Carr

Table 6.

EXPLORATION STATISTICS - 1984

	No.	Claim Equivalent	Hectares	% Inc. Over Prev. Year (Decrease)
Prospecting Licences Sold[1]	338	-	-	(4.8)
Claims Recorded	2,703	-	43,248	(38.0)
Claims Renewed	4,992	-	79,872	(29.8)
Claims Expired	5,601	-	89,616	(3.9)
Claims Converted to Mining Licences	-	480	7,680	(1.6)
Mining Licences Renewed	138	10,986	175,776	1.6
Mining Licences Expired	8	310	4,960	(56.3)
Potash Leases in Effect	2	1,734	28,074	0
Other Leases in Effect	3	403	6,506	.3
Total Claims and Claim Equivalents in Effect	-	21,298	340,768	(14.5)
Oil-Gas Licences[2]	53	-	1,318,965.3	0
Oil-Gas Leases	1	-	2,156	0
Bituminous Shale Development Permit[3]	1	-	1,439	-
Bituminous Shale Leases	-	-	-	-
Underground Storage Licences	-	-	-	-
Underground Storage Leases	-	-	-	-
Quarry Permits	303	-	122	9.4
Quarry Leases	7	-	481.35	9.6
Peat Licences	4	-	1,000	33.3
Peat Leases	22	-	9,046.5	4.8
Potash Exploration Reservation	1	-	10,125	0
Assessment Reports Submitted	104			52.9
Value of Assessment Reports Received	$2,089,977			(3.6)
Total Drilling (Metres)	14,891			50.0
Drilling Value	$771,167			24.6
No. of Holes	115			109.0
	No.	**Depth (meters)**	**$**	
Potash Exploration Expenditures				
No. of Holes	1		2,600,000	
Total Depth		1,210		
Oil-Gas Exploration Expenditures				
No. of Holes	0		3,854,300	
Total Depth		0		
Bituminous Shale Exploration Expenditures			0	

1. The number of prospecting licences sold in 1983 was incorrectly reported as 178. The correct number is 355.

2. Oil-Gas Licences should have read 1,318,965.3 in 1983 not 1,280,773.

3. Bituminous Shale Development Permit to Canoxy for 1439 ha was in effect in 1983.

MINING COMMISSIONER'S REPORT[1]

Only one mining dispute was brought to the attention of the Mining Commissioner, W.I. Spence, for resolution during the calendar year 1984. A staking conflict, involving three parties vying to record the same piece of ground, was brought down for a hearing and a decision was rendered based on the evidence heard.

Brunswick Mining and Smelting Corporation Limited
and Brian Wilson

VS

Billiton Canada Limited.

The Mining Commissioner's contract expired August 12, 1984 and was not renewed until March 1985.

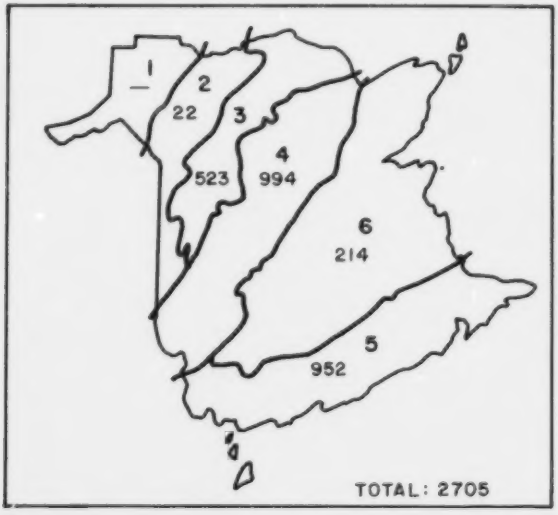

Figure 7. Number of claims staked by metallogenic region in 1984.

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1 Written by W.I. Spence.

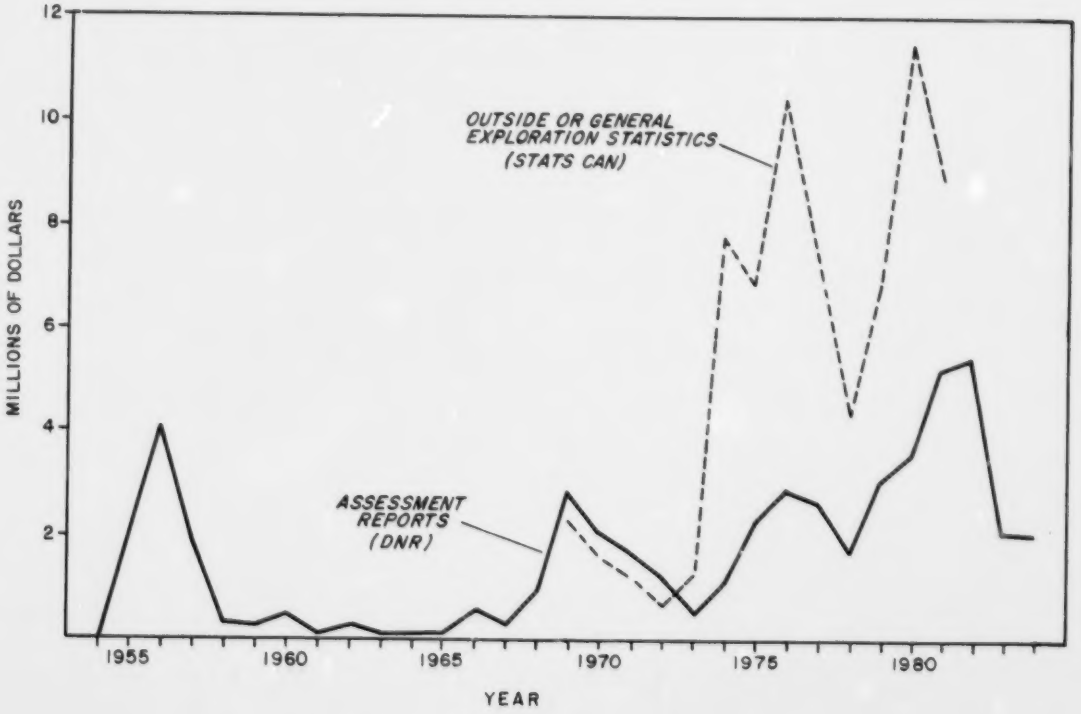

Figure 8. Exploration expenditures in New Brunswick, 1954-1984.

CHAPTER 2. MINERAL EXPLORATION IN NEW BRUNSWICK

METALLIC MINERALS[1]

Exploration activity in northern New Brunswick during 1984 continued at a low level and, as in the past five years or so, Brunswick Mining and Smelting Corporation and Noranda Exploration were the principal explorers. However, there was a flurry of activity toward the end of 1984 when it became known that gold and gold-silver occurrences had been discovered by a local prospector, Michael Smith and others working for the New Brunswick Prospecting Syndicate (Lacana Mining Corporation 45%, Lynx Canada, Spartan Resources, M.E.X. Exploration, Acadia Minerals Ventures, and Silver Sceptre Mines).

Mr. Smith found an interesting gold showing in the Silurian rocks near the Upsalquitch River some 60 km west of Bathurst, that started a moderate staking rush in that area. Riocanex optioned the property late in 1984, and is planning to trench the showing in 1985. The details of this occurrence are not known at the moment, but it appears the host rocks are Silurian arenites and conglomerates on the north limb of a northeasterly trending syncline.

The New Brunswick Prospecting Syndicate reported three discoveries (1) copper-rich sulphide float in the Shingle Gulch area (Serpentine River system), (2) a silver-gold showing in felsic volcanic rocks of the Tetatgouche Group northwest of California Lake. Chip samples assayed from 0.103 to 0.923 g/t (0.003-0.027 oz/ton) gold and 308.6 to 617.1 g/t (9-18 oz/ton) silver over 1.5 m (5 feet), and (3) a gold-silver-base metal occurrence in Ordovician sedimentary rocks near Alcida. Chip samples from this showing assayed 0.411 to 3.600 g/t (0.012-0.105 oz/ton) gold, and up to 257.1 g/t (7.5 oz/ton) silver.

Brunswick Mining and Smelting Corporation Limited and Noranda Exploration investigated several properties all over New Brunswick but reported no discoveries. Brunswick Mining and Smelting and Heath Steele Mines showed interest in undeveloped massive sulphide deposits in the Bathurst-Newcastle area owned by Anaconda, Cominco and Kidd Creek Mines; however, no official news has been released by the companies involved. Brunswick Mining and Smelting continued to investigate the Flat Landing Brook massive sulphide deposit, but results so far have not changed the subeconomic status of this deposit.

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1 Written by J.L. Davies and A.A. Ruitenberg.

Placer Development Limited has optioned its interest in the Restigouche sulphide deposit to Lincoln Resources. BP Resources investigated their West Wedge property as a follow up to their discovery of massive sulphides on their claims in 1983. Two or three new base metal showings were discovered by BP on claims northwest and west of the West Wedge deposit.

Walter Sharpe prospected areas underlain by Carboniferous rocks east of Bathurst. He carried out detailed gravimetric surveys over regional gravity highs, and located a few peripheral residual anomalies. Drill holes were put down in late 1984 and early 1985 to test these anomalies, but the results have not been reported. Also in 1984, exclusive exploration rights to 4144 km^2 (1600 square miles) of the Carboniferous platform were assigned to Atlantic Orebodies Limited, who intend to launch their program in 1985.

Other companies and individuals reporting work in northern New Brunswick are Lac Minerals Ltd., Amoco Canada Petroleum, Miramichi Lumber Company, J.D. Irving, Millstream Mines, Heron Mines, Kidd Creek Mines, Mactacquac Mining, McIntyre Mines, Granges Exploration, Norman Pitre, C.A. Willett, T.G. Mersereau, Delbert Johnston, Wayne Carroll and Michael Smith. (Figure 9).

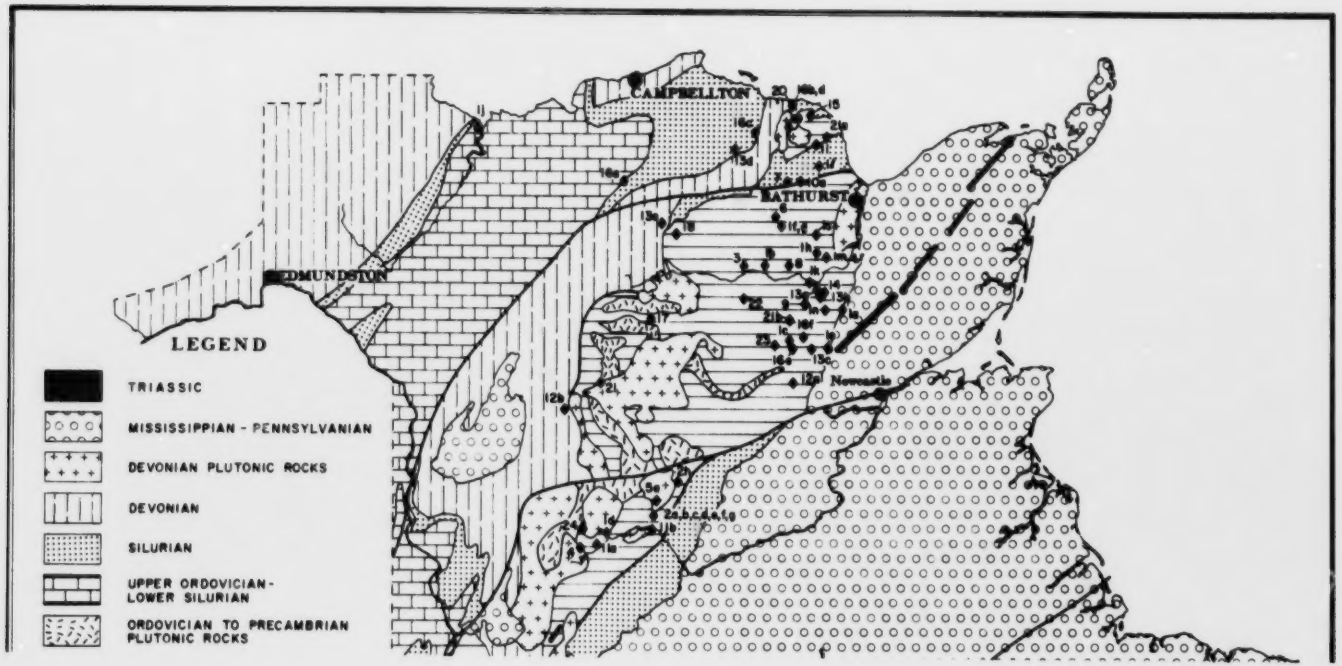
Mineral exploration in southern New Brunswick continued to be concentrated in the gold-bearing rocks along the Bay of Fundy coast.

Deepening of the shaft at Lake George Antimony-Gold Mine was started in 1984 to provide access to the newly discovered ore body. Accelerated demand increased the price of antimony to $3.30 - $3.53 per kilogram ($1.50-$1.60 per pound) in December of 1984.

The following pages summarize information contained in the assessment reports received by Mineral Resources Division in 1984. They are listed by metallogenic zone, then by company/individual and then by property names. In addition the GEOSCAN numbers are provided to assist in referencing the reports.

Generally, the company/individual name refers to the holder of the claims or Mining Licence. In some cases, where an individual registers the claim but an associated company is more readily known, the company name has been given in brackets ( ).

The property names are those used in the assessment reports; where none is given a geographic location is usually added (e.g. Musquash Harbour area).


CAMPBELLTON
BATHURST
EDMUNDSTON
Newcastle
LEGEND
TRIASSIC
MISSISSIPPIAN - PENNSYLVANIAN
DEVONIAN PLUTONIC ROCKS
DEVONIAN
SILURIAN
UPPER ORDOVICIAN - LOWER SILURIAN
ORDOVICIAN TO PRECAMBRIAN PLUTONIC ROCKS

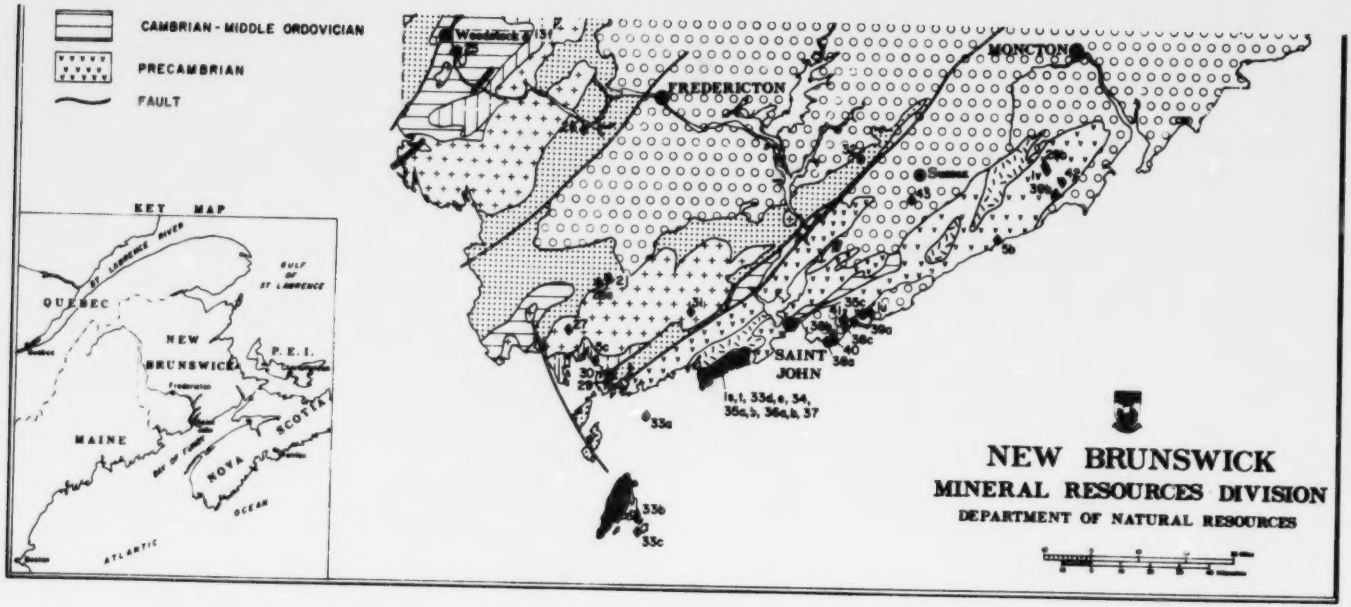


Figure 9. Location of properties for which assessment reports were filed in 1984 (legend continued on p. 38).

Companies and Individuals Exploring
Properties in 1984 (to accompany Figure 9)

1. Brunswick Mining and Smelting Corporation Ltd.
2. Kidd Creek Mines Limited
3. BP Resources Canada Limited
4. Riocanex Inc.
5. Mactaquac Mining Ltd.
6. Anaconda Canada Exploration Limited
7. Louis Liautaud
8. C.A. Willett
9. Bryan Wilson
10. Millstream Mines Limited
11. Miramichi Lumber Company (Limited)
12. Amoco Canada Petroleum Company, Limited/ Lac Minerals
13. Billiton Exploration Canada Limited
14. McIntyre Mines Limited
15. Heron Mines Limited
16. N. Pitre
17. Wayne Carroll
18. A.J. O'Donnell
19. J.W. McCarthy
20. J. Archibald

21a. T.G. Mersereau/J. Pitre

22. Delbert Johnston
23. Mattagami Lake Exploration Limited
24. J.D. Irving Ltd.
25. R. A. Mann
26. Durham Resources Inc.
27. Appalachian Resources, Inc.
28. Acadia Minerals Ventures Ltd./ M. Stewart
29. Highbourne Explorations Limited
30. Mascarene Mines Limited
31. Derek F. Brown
32. Lac Minerals Ltd.
33. V.N. Rampton
34. Goldfluor Exploration Limited
35. Rex Silver Mines Ltd.
36. Peter Fenety
37. Newbrun Resources Inc.
38. Gordex Minerals Limited/Morton Gordon
39. J. Newhouse
40. H.C. McNamara
41. Cuvier Mines Inc.
42. W. Burton
43. A.W. Lockhart

MIRAMICHI ZONE

(1) Brunswick Mining and Smelting Corporation Limited

(a) Portage River Claim Gp., Project 223 (473066) 21 P/5W

Reported work comprises 199 km (124 miles) of line cutting. The area has been explored by several companies and many targets have been drilled. However, no interesting mineralization has been found. Magnetometer and electromagnetic surveys were carried out in mid-1984, but the results have not been filed.

(b) Canoe Landing Lake Extension Claim Gp., Project 211 (473005) 21 O/8E

This 68-claim group surrounds the Canoe Landing Lake sulphide deposit found in the sixties by Consolidated Zinc (M.L. 1231) (see also Information Circular 84-1).

Thirteen kilometres (8 miles) of picket lines were cut in 1983 over new claims on the west end of the property. Max-Min II electromagnetic, magnetometer, gravity and soil geochemical surveys were carried out and five drill holes were put down to test the targets outlined.

The EM survey results proved difficult to interpret; however, anomalies were outlined west of Forty Mile Brook. The magnetometer results were negative and geochemical results were not encouraging; however, it was discovered that overburden thicknesses ranged from 3 to 23 m (10 to 77 feet). Two small gravity anomalies were outlined.

The area is underlain by interlayered felsic tuffs, lavas, augen schists, and argillaceous (in part graphitic) sedimentary rocks. No significant mineralization was encountered in the drill holes.

(c) Island Lake Claim Gp. (472994) 21 O/8E

A small showing of sulphides was discovered in this area by O'Leary Malartic in the fifties. The area is underlain by a north-northwesterly trending, steeply dipping quartz-feldspar porphyry, felsic tuffs, chloritic tuffs and mafic tuffs. The sulphide mineralization apparently occurs within interlayered quartz and quartz-feldspar porphyries. The best O'Leary-Malartic drill intersection was 1.2 m (4 feet) grading 0.7% Pb and 1.8% Zn.

Noranda's 1983 exploration consisted of geological, soil geochemical, induced polarization and VLF-EM surveys. Large Pb and Zn anomalies were outlined over the area drilled by O'Leary. The IP results indicated three anomalies but their origin is unknown. The VLF-EM (EM-16) survey outlined weak anomalies.

(d) Gilman Brook, West Extension Claim Gp. (472978, 473084); South Extension Claim Gp. (472977) 21 J/10E

A soil geochemical survey was carried out on this property in 1983. The area is underlain by Cambro-Ordovician sedimentary rocks intruded by Devonian granite (Burnthill granite). Soil anomalies with highs of 180 ppm Cu, 420 ppm Pb, 5952 ppm Zn and 11 ppm Ag were found along the base line on the western part of the group. They are related to massive pyrite-pyritic argillite-cherty argillite. Only weak anomalies were outlined on the 'southern extension'.

A geochemical soil survey of the 'west extension' outlined lead, zinc and silver anomalies associated with strong Max-Min II conductors.

(e) Smoker Brook Claim Gp., Project 207 (473009) 21 P/4W, 5W

This property is underlain by flat-lying Carboniferous fluviatile sedimentary rocks that overlie highly deformed Ordovician rocks. The work reported in 1984 comprises the results of 1224 m (4018 feet) of drilling. Four holes were put down to test a variety of targets outlined by gravimetric, magnetometer, and electromagnetic (Max-Min II) surveys. Initial interest was aroused by an airborne 'Input' survey. Drill hole no. 207-1 cut 73 m (239 feet) of Carboniferous rocks before penetrating partly mineralized metasediments with intercalated mafic lavas. In hole 207-2 the Carboniferous, 75 m (245 feet) thick, overlies pillow metabasalt and basaltic metatuff. Minor veinlets and disseminations of pyrite and pyrrhotite were intersected. Hole 207-3, put down to test a coincident magnetometer, gravity and EM anomaly, cut 65 m (211 feet) of cover rocks overlying basaltic rock similar to those found in 207-2. Hole 207-4 cut 59 m (195 feet) of Carboniferous rocks. The underlying Ordovician rocks comprised graphitic metasedimentary rocks with minor disseminated pyrite.

(f) Middle River Claim Gp., Project 213 (473027) 21 O/9E

This claim group, underlain by mafic lavas and tuffs, minor felsic tuff and argillaceous and chloritic metasediments, adjoins a property (M.L. 1249) where a chalcopyrite showing was discovered several years ago. The work reported in 1984 consists of geological and soil geochemical surveys and the results of diamond drill hole no. 213-1. The drill hole was put down to test an EM anomaly that appeared to indicate an extension of the adjacent chalcopyrite showing. The anomaly appears to be a layer of graphitic metasediments within pillow metabasalts; no significant sulphides were found. The soil results were not encouraging.

(g) Forrest Smith Option, Project 214 (473028); Forrest Smith M.L. 1249 (473029) 21 O/9E

This property, M.L. 1249, is owned by Forrest Smith who found a chalcopyrite showing on the claims in 1968. Since then, Umex and Norex have performed intensive exploration work, and have drilled several holes in the area. Work reported in 1984 comprises the results of a soil geochemical survey and the logs of drill holes 214-2 and 214-3. No soil anomaly was found associated with the copper showing and it is doubtful if the occurrence would have been found by a geochemical soil survey alone. Both drill holes cut basaltic volcanic rocks with a few interlayers of sedimentary rocks. Disseminated pyrite was intersected but was most abundant in a magnetite layer in 214-3 at a depth of 405 m (1330 feet).

(h) Grandroy Option, Project 122 (472989) 21 P/5W

This property (M.L. 1295) was optioned from T. Mersereau and N. Pitre in 1979. The claims are tied to the south boundary of the Brunswick No. 12 grant. The area is underlain by highly deformed interbedded metasedimentary rocks and felsic tuffs with relatively minor basaltic tuff.

The work reported in 1984 consists of drill hole 122-1 and 122-1A (wedged off 122-1 at 150 m). The hole intersected argillite, graphitic argillite, and greywacke in the first 310 m, passing into felsic lavas, metasediments and mafic tuffs to 374 m, and finally into crystal tuffs and tuffaceous sediments to a depth of 553 m. No significant sulphides were found.

(k) Nepisiguit Brook Claim Gp. (473068) 21 P/5W

Prospecting and an EM-16 survey was carried out on this 65-claim group in 1984. The property is underlain by highly deformed, southerly trending, felsic and mafic metavolcanic rocks with intercalated metasediments.

The EM-16 survey was aimed at locating the source of weak airborne Input anomalies outlined by Sabina several years ago. The results indicated no obvious explanation for the anomalies.

(m) Maritimes Mining North Property, M.L. 1244 (473075) 21 P/5W

This property adjoins the north boundary of the Brunswick Mining and Smelting No. 6 grant. The 1984 work consisted of Max-Min II and magnetometer surveys. The EM and magnetic anomalies outlined appear to have been explained by previous drilling.

(n) Captain Claim Gp. (473076) 21 P/5W

This 50-claim group surrounds the Captain sulphide deposit. The 1984 work comprised magnetometer and VLF-EM surveys.

Generally, magnetic relief is low; however, the Captain deposit is outlined, as is a thin iron formation along the eastern boundary. Three EM anomalies are indicated, one over the Captain deposit, the other two in the southeastern and northwestern corners of the property.

(o) Theriault Gate Property, M.L. 1179 (473083) 21 P/5W, 12W

Several drill holes have explored targets in this area over the 32 years since the discovery of the Brunswick No. 12 deposit. The 1984 work comprised yet another drill hole put down to 651 m (2,138 feet) in an attempt to find the Brunswick Mine rock sequence at depth. The only intersection of note was 3.5 m (11.4 feet) from 346.9 to 350.4 m (1,138.1 to 1,149.5 feet) that contain 3 to 10% pyrite. Correlation with the mine rock sequence apparently is not clear.

(q) Fab Claim Gp., Project 218 (473082) 21 P/5W

This property has been extensively explored since 1952 and despite numerous drill holes, only weak zones of sulphide mineralization have been found. The property lies on the so-called 'favourable horizon' between the Brunswick No. 12 and No. 6 deposits and is underlain by highly deformed felsic and mafic volcanic rocks and a variety of intercalated metasedimentary rocks. Work reported in 1984 consisted of Max-Min II, magnetometer and gravity surveys, as well as a compilation of past drilling. Most of the anomalies obtained appear to have been drilled in past campaigns. Some shallow targets, as well as the 'Brunswick horizon' at depth, need further drilling.

(r) Mersereau-Pitre Option (473085) 21 P/5W

Five major conductors were outlined on this property as a result of a Max-Min II electromagnetic survey. The area has been intensively explored since 1952, since it lies on the 'favourable horizon' between the Brunswick No. 12 and No. 6 deposits. It appears that each conductor detected in the recent work has been drilled in previous campaigns.

(2) Kidd Creek Mines Limited

(a) Four Mile Brook Claim Gp. (473013, 473100) 21 J/10E

This 25-claim group was optioned from Sulpetro Minerals Limited in 1982. The interest in the property was aroused by a tin soil anomaly (72 ppm).

The area is underlain by quartzite and phyllite overlain by mafic, volcanic and argillaceous sedimentary rocks of the Tetagouche Group. These rocks are intruded by post-tectonic Devonian granite. Work reported comprises geological mapping, a soil geochemical survey and trenching.

Anomalous Mo was outlined in soils over the granite-hornfels near the northeast corner of the grid. Several moderately high W values were found over granite in the south part of the property. Fluorine anomalies were absent.

In 1984, nine trenches were excavated in two areas and three drill holes were put down to test a feldspar-cassiterite vein. The trenches uncovered a variety of Sn sources (bedrock and boulders) including high grade metamorphic rocks (cordierite-garnet), hornfels, mafic metavolcanic, breccia sediment, and granite containing up to 277 ppm tin. Tin-bearing boulders were found associated with a feldspar-cassiterite vein in other trenches, and one assayed 31.06% tin over 10 cm.

Each drill hole cut the feldspar-cassiterite vein hosted by coarse- to medium-grained granite. The best intersections were as follows:

Drill hole no.	Interval (m)	Width (m)	Sn(%)
FMB-1	19.86 to 20.29	0.43	0.22
	27.72 to 27.87	0.15	4.07
	28.12 to 28.37	0.25	0.23
	28.83 to 28.95	0.12	0.44
	29.30 to 29.50	0.20	0.73
	81.52 to 81.57	0.05	0.60
FMB-2	26.82 to 27.04	0.22	0.42
	47.05 to 47.17	0.12	0.26
FMB-3	66.94 to 67.06	0.12	0.44
	85.51 to 85.61	0.10	0.95

(b) Dungarvon Claim Gp. (473012, 473103) 21 J/10E

These claims lie east of the Sulpetro claims (2a). Most of the property is underlain by Devonian granite and surrounding hornfels. Six southeasterly trending cassiterite-bearing veins have been found on these claims.

The work reported comprises a soil geochemical survey and trenching. Soils were analyzed for Sn, Mo, W and F. Strong northeasterly trending Sn anomalies are associated with three of the veins whereas weaker anomalies occur near the other three.

One trench uncovered cassiterite in a feldspar vein, but bedrock was not uncovered in the other trenches.

One trench extended a cassiterite-quartz vein for over 50 m, and another uncovered two cassiterite occurrences.

A second report, filed in late 1984, describes the results of trenching and drilling in the quest for tin-bearing veins. The trenching revealed a till, 1/2-1 m thick, containing debris derived up to 2 km to the west, and underlain by 1-10 m of weathered granite. Several northwesterly trending tin-bearing veins were uncovered and tested by drill holes. Five drill holes were put down and all encountered interesting but uneconomic tin content. The best intersections were as follows:

Drill hole no.	Interval (m)	Width (m)	Sn(%)
DUN-1	26.77 to 26.83	0.06	10.81
	56.96 to 57.12	0.16	0.08
DUN-3	34.25 to 34.67	0.42	0.52
	52.62 to 52.92	0.30	0.17
DUN-4	10.00 to 11.00	1.00	0.07
	11.00 to 12.00	1.00	0.13
	12.00 to 13.00	1.00	0.08
	13.00 to 14.00	1.00	0.16
	67.75 to 67.85	0.10	0.27
DUN-5	43.36 to 43.42	0.06	2.22

(c) Rocky Brook Property, M.L. 1334 (473014) 21 J/10E

The area is underlain by a small pluton of Devonian granite that intrudes Upper Tetagouche Group sedimentary rocks. An interesting Mo-F prospect was found in this area some years ago.

In 1983, 659 soil samples, collected in previous years, were analyzed for tin. The results indicated weak anomalies associated with shear zones.

(d) Rocky Brook North Property, M.L. 1335 (473017)
21 J/10E

This property is underlain by mafic volcanic rocks and argillites of the Tetagouche Group intruded by the Devonian Dungarvon Granite.

In 1983, 868 soil samples were collected and analyzed for tin. No anomalies were outlined.

(e) Dungarvon East Claim Gp.
(473018, 473099) 21 J/10E

This 62-claim group is underlain by pink to red Devonian Trout Brook Granite with pink quartz-feldspar porphyry phases that intrudes siltstone, greywacke and shale of the Tetagouche Group.

In 1983, 1417 soil samples were collected and analyzed for tin, and some were also analyzed for W, Mo and F. Magnetometer and VLF-EM surveys were also carried out.

Several east-west-trending VLF-EM conductors were outlined; however, the strongest is continuous with an induced polarization and VLF-EM conductor discovered on the claims to the west. It is interpreted as a reflection of the Carson Lake fault system. The significance of the other conductors is not known. The Cleveland Zn-Cu-Mo-Pb prospect is marked by a weak anomaly. The magnetic survey was useful in outlining the granite-hornfels contact zone.

A second report, filed in 1984, describes the results of geological and magnetometer surveys. Ninety-five rock samples from bedrock and boulders were analyzed for Sn, W, Cu, Mo, Ag, Au, As, Be, F and Ti. Several contain interesting contents of W and a few contained significant Au.

(f) Fall Brook Claim Gp. (473003) 21 J/10E

This property forms the southeast corner of a large group of claims (see 2a, b, c, d, and e). This area is underlain by Tetagouche Group siltstone, greywacke and shale.

Work in 1983 consisted of trenching and analysis of soil samples for Sn, Mo, F and W. The discovery of a cassiterite-quartz vein (3.12% Sn) in a greywacke boulder prompted the trenching. Greywacke bedrock had abundant southeasterly trending fractures filled with quartz-epidote. A grab sample contained 7483 ppm Sn. The soil results indicated a strong north-northeasterly trending Sn anomaly.

(g) Trout Lake Claim Gp. (472998) 21 J/10E

These claims are largely underlain by the Trout Brook Granite, a greyish pink, medium- to coarse-grained biotite granite. The granite intrudes siltstones and greywackes. Previous work had outlined a soil Sn anomaly, and an east-west-trending VLF-EM conductor.

The 1983 work comprised soil geochemical, VLF-EM and magnetometer-gradiometer surveys. Fifty-three soil samples collected along three picket lines (46E, 49E and 51E) were analyzed for Mo, F, W and Sn. Many samples were anomalous, and a more detailed survey is necessary. The VLF-EM relocated the previously known conductor, though its source is unknown.

(h) Peaked Mountain Claim Gp.
(472992, 473102) 21 J/10E

A till sample containing 330 ppm W aroused interest in this area in 1982. Follow-up exploration led to the discovery of a low grade W-Mo quartz vein system trending 110-120°. The vein system contains scheelite, molybdoscheelite and molybdenite in a roughly east-west trending zone

1100 m long and 250 m wide. The vein system is hosted by mafic metavolcanic rocks within the contact aureole of the Devonian Dungarvon Granite.

In 1983 soil geochemical and VLF-EM surveys were carried out. The results indicated the weakly developed soils (B-horizon) over the main zone are slightly anomalous in Mo and W. Mo is also anomalous in humus. A weak Mo-Sn anomaly occurs in the vicinity of the original till anomaly. The VLF-EM survey outlined a conductor trending 100-105° through the mineralized zone.

In 1984 tungsten-bearing boulders were found west of Middle Peaked Mountain Lake and an additional seven claims were staked to cover the interesting area. A soil geochemical survey was carried out but the results are not reported.

(i) Cleaver Lake Claim Gp. (472987) 21 O/2W

Interest in this area was aroused by a N.B. Mineral Resources Division stream silt survey, that indicated anomalous W and Mo. The source of the W-Mo silt anomaly seems to be in the north-central part of the claim group. The area is underlain by a biotite granite with local phases containing muscovite. Boulders of a massive red felsite were also found locally.

The 1983 work comprised follow-up stream silt and soil geochemical surveys and geological mapping. Silt anomalies were confirmed and extended. Reconnaissance soil survey for Sn, W and Mo outlined a single sample high in the north-central part of the property, in the vicinity of the red rhyolite boulders noted earlier.

(3) BP Resources Canada Limited

West Wedge Claim Gp. (473032) 21 O/8E

This property was optioned from Northeast Exploration Services Limited in 1981. Several companies have explored the area since 1953. Base metal sulphides were discovered on the claims by Cominco in 1956-63 (mineral occurrence 003*).

In 1984 the work consisted of overburden and diamond drilling. The overburden drilling was carried out on soil geochemical anomalies found in the previous year, and successfully outlined the gossan overlying the mineralized zone in the so-called 'Bog' anomaly that had been diamond drilled with limited success in 1982. An additional diamond drill hole in this area (83-1) intersected 3.8 m of sulphides. Overburden drilling provided explanations for the other soil geochemical anomalies on the property. Five diamond drill holes were put down to test the more clearly

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* numbering system used at the Bathurst Regional Office.

outlined mineralized zone. The holes cut interbedded cherty graphitic and chloritic argillites, quartz crystal tuff, tuffaceous sediments, and altered mafic volcanic rocks. Sulphides were intersected in three of the holes; the best sections are summarized below:

Hole no.	Interval (m)	Thickness (m)	Cu (%)	Pb (%)	Zn (%)	Ag (ppm)	Au (ppm)
WW83-1	10.4-10.8	0.4	0.21	2.97	4.12	61	0.21
	13.7-14.1	0.4	0.76	5.79	3.52	116	4.8
	14.1-15.3	1.2	0.91	6.19	17.20	47	1.06
	15.3-16.6	1.3	0.92	4.05	12.80	66	0.62
	16.6-17.5	0.9	0.44	5.78	11.10	88	0.99
		3.8	0.78	5.35	12.84	64	1.18
	19.0-19.1	0.09	2.30	6.79	2.89	86	1.47
	21.2-21.6	0.4	0.35	0.05	2.00	0.01	0.12
	21.6-22.3	0.7	0.25	1.53	4.73	15	0.31
	22.3-22.6	0.3	0.10	0.29	1.81	0.01	0.07
	22.6-23.0	0.4	1.12	3.12	4.53	46	0.27
	23.0-23.9	0.9	1.17	5.94	11.50	41	0.41
		2.7	0.68	2.85	6.22	24	0.28
WW83-1	26.3-26.9	0.6	0.30	1.63	7.06	0.01	0.14
	26.9-27.4	0.5	0.10	1.06	2.21	0.01	0.07
WW83-2	26.1-27.4	1.3	0.21	1.38	4.96	0.09	nil
WW83-3	17.2-17.3	0.1	0.05	0.66	2.08	(not given)	
	22.0-24.7	2.7	0.69	2.88	6.22	22	0.25

The drilling has outlined a pyritic sphalerite-galena-chalcopyrite sulphide deposit over 61 m long with a thickness ranging from 0.64 to 3.8 m (2-12 feet). In hole 83-1, the thin upper layer (0.4 m) is overlain by sericitic crystal tuff, and is underlain by chloritic argillite with chalcopyrite veinlets. A second layer, 13.7-17.5 m, is sandwiched between layers of chloritic argillite with chalcopyrite veinlets. A third sulphide zone from 21.2 to 23.9 m is overlain by altered porphyritic basalt. The sulphides occur in a cherty and, in part, sericitic gangue and overlie cherty argillite, lithic tuff and mafic porphyry.

Geological, soil geochemical and Max-Min surveys were carried out on three picket-line grids north and west of the West Wedge sulphide deposit (M.L. 1368). The area is underlain by porphyritic and chloritic metarhyolite, metabasalt and metabasaltic tuff, maroon cherty shale and siltstone, interbedded with dark argillite. Siliceous graphitic

and/or pyritic metasediments were noted in many places. Diorite-granodiorite intrudes the above rocks, and is partly surrounded by 'cataclasites', 'phyllonite' and schist. It occurs southeast of Strachens Lake and south of White Birch Lake.

Three sulphide occurrences were discovered during the geological mapping, (1) chloritic rhyolite boulders containing irregular streaks and disseminations of pyrite, chalcopyrite, galena, and sphalerite. Coarse-grained galena veinlets were also observed, (2) a band of galena with pyrite hosted by pyritic, chloritic rhyolite on the east side of Forty Four Mile Brook (Forty Four Mile Brook grid), and (3) mafic volcanic boulders containing cherty lenses with pyrite, sphalerite, galena and chalcopyrite. The latter showing lies within a Pb-Zn soil anomaly.

The soil geochemical survey outlined five Pb-Zn-Cu-Ag (strontium) anomalies judged to be worthy of follow up. The best of these anomalies is associated with showing No. 3 (above) in the southwest corner of the property.

(4) Riocanex Inc. (changed to Rio Algom Expl. Inc.)

McDonald Brook Claim Gp. (472927) 21 J/10W

Initial interest in this area arose from a N.B. Mineral Resources Division stream silt survey published in 1976. Work reported in 1984 comprises two drill holes put down to test a coincident EM, magnetic, gravity and soil geochemical anomaly. The area is underlain by hydrothermally altered schists and gneisses intruded by the Nashwaak Granite. The drill holes encountered a variety of micaceous schists and gneisses with minor granitic and quartz veining. Minor amounts of chalcopyrite, sphalerite and rare galena seem to explain the geochemical anomaly, whereas local concentrations of pyrite-pyrrhotite gave rise to the geophysical anomalies.

(5) Mactaquac Mining Ltd.

(a) Hurd Lake Claim Gp. (473039) 21 J/10E

This property is underlain by the Dungarvon Granite. A Mineral Resources Division stream silt survey drew attention to the area in 1980, and follow-up work resulted in the discovery of Sn, W and Mo silt anomaly in a small brook draining Hurd Lake.

Work filed in 1984 reports the results of a heavy mineral survey of stream silt and till, designed to locate the source of the stream silt anomaly mentioned above. Several soil and silt samples were also analyzed for Cu, Zn, Pb, Mo, Sn, W, Ag, Au and As.

The heavy mineral fractions from several stream silt samples on Hurd Lake Brook indicated a source some 600 m

upstream from its confluence with Rocky Brook. Some of the till samples also contained anomalous Sn (up to 1400 ppm).

(6) Anaconda Canada Exploration Limited

Armstrong 'B' Property M.L. 1100 (472966) 21 O/9E

The Armstrong 'B' is a low grade pyritic Zn-Pb-Cu deposit found in the mid-fifties. The work filed in 1984 comprises results of a Pulse EM survey of the northern part of the deposit. No new targets were outlined.

(7) Louis Liautaud

Millstream area (472912) 21 P/12W

Work reported on this property consists of stream silt and soil geochemistry carried out to check weak base metal anomalies found previously. The anomalies were not reproduced.

(8) C.A. Willett

Nine Mile Brook Property, M.L. 1355 (473034) 21 O/8E

This property covers a small Zn-Pb-Ag-Cu sulphide showing discovered by Mr. Willett in 1975 within sedimentary and volcanic rocks of the Tetagouche Group. Work reported in 1984 comprises a mining licence survey, and a Ronka VLF-EM survey. The conductor, presumably related to the mineralization, was traced for 180 m.

(9) Bryan Wilson

Claim 321596 (473037) 21 P/5W

This claim is underlain by intercalated quartz-feldspar crystal tuff and metasedimentary rocks similar to those hosting the Captain sulphide deposit to the north. Previous work has outlined VLF-EM, induced polarization, and gravity anomalies on the claim.

(10) Millstream Mines Limited

(a) Rocky Brook area, M.L. 1212 (473010) 21 P/12W

This property covers several Zn-Pb-Ag vein deposits discovered nearly 100 years ago. Unsuccessful attempts were made in the fifties by Quebec Sturgeon River Mines to mine one of the deposits (Shaft zone). Intense exploration over the past 30 years has outlined other showings in the area. The deposits are hosted by highly deformed Tetagouche Group sedimentary rocks. A faulted unconformity separates them from Silurian clastic sediments and minor skarn.

In 1983, seven drill holes (663 m) were put down and several trenches were excavated to investigate VLF-EM conductors, soil geochemical anomalies and extensions of known veins. Hole 1-83 tested VLF-EM anomaly associated with skarn occurrence (mineral occurrence 0094*). No base metal sulphides were encountered. Hole 2-82 investigated a VLF-EM conductor but again no sulphides were found. Hole 3-83 was drilled in the Shaft zone (mineral occurrence 0043B*) and encountered Pb-Zn-Ag-Au mineralization from 65.5 to 96 m. The best section was as follows:

Hole no.	Interval (m)	Thickness (m)	Pb (%)	Zn (%)	Ag (g/t)	Au (g/t)
3-83	77.7 -78.6	0.9	2.94	3.40	157.71	0.274
	84.5 -85.5	1.0	1.20	2.40	70.97	0.823
	89.9 -94.5	4.6	3.30	2.48	242.06	1.714

Drill hole 4-83 was put down to extend the Hachey zone (mineral occurrence 0043A*) to the west. Sulphide mineralization was encountered from 37.9 to 68.1 m. The best intersections were:

Hole no.	Interval (m)	Thickness (m)	Pb (%)	Zn (%)	Ag (g/t)	Au (g/t)
4-83	37.9 -39.6	1.7	1.80	4.20	99.09	0.206
	47.9 -48.8	0.9	0.76	2.60	76.11	1.714
	67.97-68.12	0.15	14.80	7.60	2442.17	8.229

Drill hole 5-83 tested a soil-base metal anomaly approximately 100 m south of the Hachey Zone, but no mineralization was encountered. Drill hole 6-83, put down under a soil-base metal anomaly, 150 m southwest of the Hachey Zone intersected a new vein system approximately 30 m wide. The best intersections were as follows:

Hole no.	Interval (m)	Thickness (m)	Pb (%)	Zn (%)	Ag (g/t)	Au (g/t)
6-83	84.9 -90.8	5.9	1.88	2.77	127.89	0.480
	109.9-110.8	0.9	0.34	1.04	40.46	0.549

* numbering system used at the Bathurst Regional Office

(11) Miramichi Lumber Company (Limited)

(a) McLean Brook Property, M.L. 1330 (473019) 21 J/10W

Assessment work filed on this property describes a trenching program carried out to delineate quartz-cassiterite-wolframite veins found earlier. Four trenches were excavated but the findings are not described. However, several pages are devoted to the behaviour expected of prospectors and explorationists on Miramichi Lumber Co. (Limited) freehold property.

(b) Rocky Brook Property, M.L. 1322
(472972, 473106) 21 J/10E

In 1983 and 1984, soil geochemical, EM-16 and magnetometer surveys were carried out on this property. The soil samples were analyzed for 31 elements. This 11-claim group is underlain mostly by Devonian granite, and the interest in the property stems from possible Mo-W veins. No significant anomalies seem to have been found, though the results are not discussed. The protocol to be followed by other exploration companies and prospectors comprises most of the text of one report.

(12) Amoco Canada Petroleum Company, Limited

(a) Arthur Taylor (472990) 21 O/1E

This property was optioned by Amoco Canada Petroleum Company Limited. Work reported comprises line cutting and diamond drilling completed in 1983. Two drill holes were put down to test unspecified geophysical (electromagnetic?) anomalies. The holes intersected mainly black and grey siltstone intercalated with conglomerate siltstone and greywacke. No significant sulphide concentrations were encountered.

(13) Billiton Canada Limited

(a) Portage River Property (473011) 21 P/5W

This large property comprises M.L. 1238, 1239, 1246, 1264, 1288 and an additional 29 claims staked in 1983. The area has received a lot of attention from several exploration companies over the last 30 years or so, but only a few small base metal showings have been discovered. The area is underlain by northerly trending, vertically dipping, interbedded felsic volcanic and sedimentary rocks.

The 1983 work reported comprises 41 km (25.5 miles) of line cutting, and a soil geochemical survey. Complex northerly trending, Pb-Zn soil anomalies occur over an area 610 m wide and more than 914 m long. There are few Cu anomalies; however, one of the strongest is coincident with a Pb-Zn anomaly.

(b) Sprig Brook Claim Gp. (472884) 21 P/4W, 5W

This property consists of 12 claims optioned from K.D.A. Whaley in 1981, and 116 claims staked by Billiton. Most of the area is underlain in northeasterly trending interbedded Tetagouche Group slate and greywacke, but in the northwest, felsic and mafic tuffs with iron formation comprise the bedrock. The geology is sketchy due to poor rock exposure. The work reported in 1984 comprises soil geochemical, magnetometer, VLF-EM, and Max-Min II surveys. The soil analyses revealed only a few abnormal samples. The anomalous samples, occurring along the Tomogonops River, seem to be derived from the Heath Steele tailings pond. A number of weak anomalies were also outlined in the felsic-mafic volcanic terrain. The magnetometer survey clearly distinguishes the sedimentary and volcanic terranes. Numerous VLF-EM conductors were found, but most appear to be formational and attributable to graphitic rocks. Mafic tuff with interbedded iron formation gave rise to anomalies, and at least five conductors were traced in felsic tuffs. A Max-Min II conductor, traced the length of the grid, seems to be coincident with 'dirty' quartz-feldspar metaporphyry.

(c) CNE Claim Gp, (473061) 21 P/5W

This 27-claim property was extensively explored by the South Bathurst Joint Venture in the late seventies. Billiton reports that line cutting and a magnetometer survey were carried out in 1984.

Magnetic anomalies were attributed to gabbro and iron formation.

(f) Gravel Hill Property, M.L. 1324 (473060);
Gravel Hill Claim Gp. (473015) 21 J/3E

The Gravel Hill prospect is immediately south of the junction of Highways 505 and 104, about 3 km northwest of the village of Millville. The prospect was found by Robert Connor, a long-time local prospector.

The claim group is underlain by Devonian, intensely deformed mafic and felsic volcanic rocks that are in faulted contact with Silurian sedimentary rocks to the west and Ordovician volcanic and sedimentary rocks to the south and east. Pyrite, spalerite, galena, chalcopyrite, jamesonite and small amounts of gold and silver occur in disseminations and in stringers that cut across certain fragmental horizons in the Devonian volcanic sequence. Billiton reported the results of magnetic and IP surveys conducted on the property, but no significant anomalies were detected.

(14) McIntyre Mines Limited

Portage River Property, M.L. 1264 (472988) 21 P/5W

This mining licence was optioned from McIntyre Mines Limited by Billiton Canada Limited. A geological survey, carried out by Billiton in 1983, indicated the property was underlain by a variety of northeasterly trending mafic tuffs, quartz-feldspar crystal tuff, sedimentary rocks and interbedded felsic and quartz-feldspar crystal tuffs.

(16) N. Pitre

(f) Railroad Claim Gp. (473087) 21 P/5W

This property is underlain by highly deformed Ordovician felsic and mafic volcanic rocks interbedded with metasedimentary rocks. Previous exploration by the South Bathurst Joint Venture culminated in a drilling program but no significant mineralization was found. The current holder has filed a geological compilation.

(17) Wayne Carroll

Meridian Brook Claim Gp. (473067) 21 O/7E

Work reported on this group consists of a soil geochemical survey, trenching, analysis of rock samples. The initial interest stemmed from reports of gold in quartz veins in 1931-32. Three northwesterly trending quartz veins were noted, one could be traced for 900 m (3000 feet). One vein contained vugs coated with galena. The veins cut metamorphosed Ordovician sedimentary rocks within a contact aureole surrounding Devonian granite.

The results of the soil survey outlined lead, zinc and silver anomalies, and several minor copper anomalies. Of the nine rock samples from trenches, six assayed 0.069-4.11 g/t (0.002-0.12 oz/ton) Au. One sample contained 5.4% Pb and 236.6 g/t (6.9 oz/ton) Ag.

(18) A.J. O'Donnell

Restigouche Claim Gp. (473071) 21 O/9W

This property, consisting of 30 claims, lies between the Murray Brook and Restigouche sulphide deposit (M.L. 1180 and 1237, respectively).

The 1984 work comprised a soil geochemical survey that outlined weak zinc anomalies that require follow up geophysical surveys.

(21) J.C. Pitre

(b) Roche Long Lac Claim Gp. (473086) 21 P/4

The assessment work filed in 1984 comprises a compilation of data gathered by Roche Long Lac Gold Mines (1981-82) and Northeast Exploration Services Limited (1980-84).

The mineralization consists of disseminated pyrite-sphalerite-galena discovered by drilling ground EM conductors in 1956. The host rocks are metasedimentary rocks intercalated with felsic metavolcanic rocks.

(22) Delbert Johnston

Otter Brook Claim Gp. (473119) 21 O/8E

Assessment work reported comprises prospecting, and VLF-EM and soil geochemical surveys. Soil analyses listed indicate a strong Pb-Zn anomaly in the B-horizon. The significance of the VLF-EM results are not described.

(23) Mattagami Lake Exploration Limited (Noranda)

Mountain Brook Claim Gp. (473118) 21 O/1E

Previously unreported drilling on this property (mineral occurrence 0174*) had indicated widespread weak disseminated Pb-Zn sulphides. In 1982 drill hole MB 82-1 intersected 4.9 m (16 feet) of 1.48% Cu+Pb+Zn and in 1983 the following intersections were obtained.

Hole no.	Width (m)	Pb (%)	Zn (%)	Cu (%)	Ag (g/t)
MB 83-4	0.3	4.95	4.6	0.36	13.37
MB 83-5	1.9	1.42	2.3	0.09	19.89

The host rocks are intercalated felsic tuffs, metasedimentary rocks, including iron formation and mafic tuffs.

The 1984 exploration comprised a gravity survey, four drill holes (MB 84-6, 84-7, 84-8 and 84-9), and a down-hole EM survey. The drill holes tested induced polarization and gravity anomalies, and attempted to extend the sulphide zone. The best results were obtained in MB 84-9:

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* numbering system used at the Bathurst Regional Office

Interval (m)	Width (m)	Pb (%)	Zn (%)	Cu (%)	Ag (g/t)
126.8-127.2	0.4	0.52	1.00	0.038	3.43
239.0-239.5	0.5	0.02	2.80	0.025	2.06

(24) J.D. Irving Ltd.

McLean Brook Property, M.L. 1316 (473095) 21 J/10W

Work filed in 1984 comprises an EM-16 survey. The survey was designed to investigate weak conductors related to mineralized quartz veins. The best conductor, trending east-southeast is interpreted as a fault, whereas other anomalies are associated with a granite-hornfels contact. Some conductors are spatially related to tungsten soil anomalies.

Drill hole MB 5-84, put down to test a weak conductor, intersected pink, medium-grained biotite granite and coarse-grained, gray-orange biotite granite. Mineralization encountered consisted of minor disseminations of pyrite, blebs and disseminations of molybdenite in quartz veins.

(25) R.A. Mann

Dominion No. 1 Claim Gp. (473105) 21 J/4E

R.A. Mann staked and explored a group of claims south of the Grafton Bridge, on the east side of Saint John River, about 3 km southeast of Woodstock. Around 1926, the ground was held by A.G. Noble and Associates and it was optioned at that time to N.A. Timmins Corporation. In 1940, Kayrand Mining and Development Corporation Ltd. optioned the ground and staked 12 claims.

Galena, sphalerite, chalcopyrite, minor silver minerals and gold occur in quartz-carbonate veins along a northeasterly striking fault in Cambrian-Ordovician greywacke and slate. Gold assays in the vein vary from trace to 3.43 g/t (0.10 oz/ton). In 1984, soil samples were collected to determine if there are possible extensions of the mineralized zone. The results of this sampling suggest that the mineralized zone has a strike length of at least 800 m.

TOBIQUE-CHALEUR ZONE

(1) Brunswick Mining and Smelting Corporation Limited

(i) Nigadoo Gold Claim Gp. (473040) 21 P/12W, 13W

This area is underlain by mainly calcareous Silurian sedimentary rocks containing northwesterly trending quartz-gold veins and quartz-feldspar porphyry dykes. The

gold occurrences were discovered in the thirties and have been explored sporadically since that time. This occurrence is commonly confused with the Nigadoo Zn-Pb-Ag Mine (also a northwesterly trending vein) that is some 6.5 km to the southeast.

Work reported in 1984 comprises soil and silt geochemical surveys. Several anomalous silt samples were obtained from Ellis Brook, that drains the northern part of the property, and from three brooks on the south side of the Nigadoo River.

(j) Patapedia Property, M.L. 1186 (472973) 21 O/14W

This property covers a Cu-Zn-Pb-Ag skarn occurrence associated with a felsic dyke swarm cutting calcareous rocks of the Matapedia Group.

The work consisted of the collection of 11 till samples, and 29 panned concentrates obtained from streams. One till sample assayed 4 ppb Au, and three stream silt samples contained 10 ppb, and one 20 ppb Au.

(l) Stephens Brook Claim Gp. (473072) 21 P/12W

An arsenopyrite-pyrite-chalcopyrite-gold occurrence was discovered in this area in the 1880s, and has been investigated several times since then. The area is underlain by westerly trending, steeply dipping, Silurian calcareous sediments that are intruded by a granodiorite stock and many dykes and sills of felsic and mafic rocks. The Stephens Brook occurrence seems to be associated with a northerly trending fracture zone within laminated hornfels and skarn.

The 1984 work consisted of geological, geophysical and soil geochemical surveys. Magnetometer and VLF-EM surveys outlined skarn and intrusive rocks, and generally indicate the fault zone. According to the report, anomalous soils (Zn, Cu and Au) have been found in an area underlain by skarn.

(12) Amoco Canada Petroleum Company, Limited/ Lac Minerals Ltd.

(b) Mount Costigan Property, M.L. 1260 (472943, 473035) 21 J/14E

Two reports filed in 1984 describe the results of the 1983 campaign on this breccia pipe Zn-Pb-Ag-Au deposit, that occurs in Devonian rhyolite (see Information Circular 84-1). The discovery was made by Amoco in 1973 and the property optioned to Lac Minerals in 1981.

The 1983 work comprised trenching, geological mapping and diamond drilling (1976 m). Drill holes LCO-5, LCO-8 and LCO-9 were put down in the breccia pipe zone whereas LCO-1, LCO-2, LCO-3, LCO-4 and LCO-10 were drilled south and east of the pipe. Drill holes LCO-6 and LCO-7 tested areas north of the main pipe zone.

No significant mineralization was encountered in drill holes outside the breccia pipe zone. Sulphides were intersected in LCO-5 from 6 to 301 m, in LCO-8 from 5 to 123 m and 183 to 200 m, and LCO-9 from 7 to 18 m, 37 to 200 m. The best intersections are summarized below:

Hole no.	Interval (m)	Thickness (m)	Pb (%)	Zn (%)	Ag (ppm)
LCO-5	46.5-48.0	1.5	1.07	3.30	
	48.0-49.5	1.5	1.22	6.35	
	49.5-51.0	1.5	1.03	2.95	
	51.0-52.5	1.5	3.70	6.80	11.5
		6.0	1.75	4.85	11.5
	54.0-55.5	1.5	6.90	11.20	15.5
	55.5-57.0	1.5	1.18	2.12	
		3.0	4.02	6.66	
	82.5-84.0	1.5	1.34	2.37	
	84.0-85.5	1.5	2.61	4.05	
	85.5-87.0	1.5	2.18	2.43	
	87.0-88.5	1.5	2.68	4.90	10
	88.5-90.0	1.5	4.45	4.65	
		7.5	2.65	3.68	
	96.0-97.5	1.5	2.79	5.05	
	97.5-99.0	1.5	0.67	1.61	
	99.0-100.5	1.5	1.78	5.20	
		4.5	1.74	3.95	
	134.5-135	0.8	1.10	6.15	12
	135.0-136.5	1.5	2.72	4.95	
		2.3	2.16	5.37	
LCO-8	6.0-7.5	1.5	2.85	7.85	12
	7.5-9.0	1.5	2.95	8.55	13.5
	9.0-10.5	1.5	2.55	5.05	
	10.5-12.0	1.5	2.45	2.65	11.5
		6.0	2.70	6.03	
	22.5-24.0	1.5	1.76	2.20	24.0
	24.0-25.5	1.5	3.65	4.70	15.5
	25.5-27.0	1.5	3.05	2.53	13.0
		4.5	2.82	3.14	17.3
	34.5-36.0	1.5	1.03	8.95	
	36.0-37.5	1.5	1.83	8.75	
	37.5-39.0	1.5	0.85	2.38	
		4.5	1.23	6.69	
	43.5-45.0	1.5	1.21	2.51	
	45.0-46.5	1.5	2.49	6.05	
		3.0	1.85	4.28	

Hole no.	Interval (m)	Thickness (m)	Pb (%)	Zn (%)	Ag (ppm)
LCO-9	75.0-76.5	1.5	1.73	2.54	
	76.5-78.0	1.5	0.95	3.40	
		3.0	1.34	2.97	
	94.5-96.0	1.5	1.50	3.95	
	96.0-97.5	1.5	1.05	2.23	
	97.5-99.0	1.5	1.29	3.55	
	99.0-100.5	1.5	1.81	5.65	
		6.0	1.41	3.85	
	106.5-108.0	1.5	2.73	5.40	9.5
	108.0-109.5	1.5	1.05	1.26	
	109.5-111.0	1.5	1.72	3.25	
		4.5	1.83	3.30	
	135.0-136.5	1.5	1.66	2.27	
	136.5-138.0	1.5	4.35	4.15	9.0
	138.0-139.5	1.5	8.40	5.80	28.0
	139.5-141.0	1.5	1.49	1.84	
		6.0	3.97	3.52	
	141.0-142.5	1.5	3.45	9.45	
	142.5-144.0	1.5	2.29	5.05	
	144.0-145.5	1.5	0.91	2.31	
		4.5	2.22	5.60	
	196.5-198.0	1.5	2.02	2.67	
	198.0-199.5	1.5	2.29	6.10	
		3.0	2.15	4.38	

(13) Billiton Exploration Canada Limited

(d) McNeill Brook Claim Gp. (473050) 21 O/16E

This group of claims overlies Devonian mafic and felsic volcanic and sedimentary rocks. A small epigenetic Zn-Cu-Pb sulphide occurrence was found in this area several years ago. Previous work in the sixties led to trenching and four drill holes. Billiton reports 48.8 km of line cutting and the results of a sampling survey of Noranda's grown-over trenches. The sulphides are hosted by chloritized and silicified rock. Chalcopyrite and pyrite seem to be the main sulphides with minor sphalerite and galena. Sphalerite and galena were also noted as amygdule fillings in basalt. Grab samples from rubble in the trenches assayed up to 5.54% Cu, 0.58% Pb, 0.69% Zn and 14 ppm Ag.

(e) CIPR Claim Gp. (473044) 21 O/10E

This claim group, presumably optioned from Michael Smith, is underlain by Silurian or Devonian felsic

pyroclastic rocks overlain by arkosic sandstones and siltstones. A coarse-grained leucocratic gabbro intrudes these rocks north of the claims. The mineralization appears to be galena and sphalerite in a deformed, carbonated rhyolite and rhyolite breccia. Four drill holes were put down in the seventies to test the showing; however, two holes were abandoned and only 30% core recovery was realized from the other two.

(16) N. Pitre

(a) Caribou Creek Claim Gp. (473043) 21 O/10E

The work reported on these claims consists of stream silt sampling, overburden sampling, VLF-EM and magnetometer surveys. The aim of the work was to trace the source of previously outlined anomalies in Pb, Zn, Au and Ag. Silt samples and panned concentrates yielded Au content up to 16 ppm, Pb up to 740 ppm, Zn up to 1800 ppm, and Ag up to 1.6 ppm. Two weak VLF-EM conductors were outlined.

(b) Belledune Claim Gp. (Mitchell Settlement) (473021) 21 P/13W

This property straddles what may be a fault zone separating an older sequence of metasedimentary rocks intruded by granite (Antinouri Lake Stock), from Devonian sedimentary and volcanic rocks. Initial interest stemmed from Ag-Pb-Zn-Cu sulphide veins found in the area in the early sixties. Work submitted in 1984 comprises compilation, silt, heavy mineral and soil surveys. Forty-six stream silt samples were collected and analyzed for Cu, Pb, Zn, Ag and As. Fourteen panned concentrates were also collected. Several samples were anomalous, but these may be associated with Mn, since heavy mineral concentrates were not significantly anomalous.

(c) Big Hole Brook Claim Gp. (473064) 21 O/16E

This property covers a small Pb-Zn-Ag occurrence discovered over fifty years ago in Devonian or Silurian volcanic rocks. Trenching and drilling of geochemical and geophysical targets was carried out by the Ryanor Mining Company in the early sixties. The 1984 report comprises the results of silt and heavy mineral sampling, and a small VLF-EM survey. Some silt samples were anomalous in Pb, but apparently not in Cu, Zn or Ag. No gold was found in the heavy mineral concentrates. One weak VLF-EM conductor was outlined.

(d) Mitchell Silver Claim Gp. (Patapat Brook) (473079) 21 P/13W

Magnetometer and VLF-EM 16 surveys were carried out on this claim. The area is underlain by Lower Devonian basalt intercalated with chert, limestone, sandstone and conglomerate. The mineralization comprises northeasterly trending quartz-bornite-sphalerite-covellite-galena-chalcopyrite veins up to 1.2 m (4 feet) wide. The EM-16 and magnetometer

results appear to outline vein trends whereas the 'Fraser Filter' EM data traces lithologic trends.

(20) J. Archibald

Mitchell Settlement Claim Gp. (473080) 21 P/13W

Three trenches were excavated on these two claims. According to the report, "samples have been taken but they (the samples) have yet to be assayed". The nature of the samples is not mentioned. It appears that a vein, thought to occur on one of the claims, is missing or has been lost.

ELMTREE SUBZONE

(15) Heron Mines Limited

Belledune Property, M.L. 1320 (473058)
and 1328 (473062) 21 P/13W

These groups adjoin M.L. 1155 that covers a small Zn-Cu massive sulphide deposit (Turgeon, mineral occurrence 0099*). The area is underlain mainly by basalts, basaltic tuffs, gabbro and sedimentary rocks of the Fournier Group. The work reported consists of soil geochemical, magnetometer and VLF-EM surveys.

One hundred and one samples were analyzed for Cu, Zn, Pb and Ag. Several weak anomalies were outlined, but other metals were not concentrated in significant amounts. The significance of VLF-EM conductors is not discussed.

(19) J.W. McCarthy

Belledune Pond Claim (473077) 21 P/13W

The work reported consists of a compilation of all data gathered previously by Sullico, Abitibi-Price and Mr. McCarthy. The showing, discovered by Sullico, comprises a silicified magnetite-garnet-chlorite skarn (Elmtree Group) containing disseminated and banded pyrite-sphalerite-galena. The skarn is intercalated with mafic volcanic and intrusive rocks. Composite grab samples assayed up to 4.5% Pb, 5.4% Zn, and 46.29 g/t (1.35 oz/ton) Ag. Gold was not detected.

(21) T.G. Hersereau

(a) Elmtree Group (473081) 21 P/13W

The most recent work in this area was carried out by Noranda in 1980-82. Noranda discovered a small vein deposit of Zn-Pb-Ag sulphides in drill holes, similar to many others in the region (e.g. Keymet deposit).

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* numbering system used at the Bathurst Regional Office

T.G. Mersereau's work comprised magnetometer and VLF-EM-16 surveys. Results did not indicate the veins found by previous drilling. Overburden drilling is recommended in areas of geochemical soil anomalies.

MAGAGUADAVIC ZONE

(26) Durham Resources Inc.

Durham Mine Property (Prince William),
M.L. 1235 (473020) 21 G/14E

Durham reported the results of deepening three diamond drill holes north of the mine. The holes were drilled to check the down-dip extension of the north-dipping Hibbard vein. The vein was intersected in all the holes, but antimony values were subeconomic.

ST. CROIX ZONE

(5) Mactaquac Mining Ltd.

(c) Mount Blair Claim Gp. (473152) 21 G/2W

The claim group is along Passamaquoddy Bay between St. George and St. Andrews. The property is underlain by Early Devonian felsic volcanic and sedimentary rocks. Sphalerite and galena occur in fractures and breccias associated with a rhyolite dome. Silt sampling detected highly anomalous silver values (up to 27 ppm Ag).

(30) Mascarene Mines Limited

St. George Claim Gp. (473041) 21 G/2W

Mascarene Mines explored a claim group in the Mascarene Peninsula, southwest of the town of St. George. The area is underlain by Silurian, intensely polydeformed, mafic volcanic and sedimentary rocks. Veins and disseminated chalcopyrite, pyrrhotite and minor sphalerite and galena occur near the sheared contact between volcanic and sedimentary rocks. Small amounts of copper were produced from the Oliver Cameron Mine that operated in this area during the 1860s and around 1930. Interest was revived in the area because copper-rich samples from the old ore dump yielded a maximum of 24 g/t (0.7 oz/ton) gold.

Mascarene Mines conducted magnetic and VLF-EM surveys on the property during 1984. The magnetic survey delineated the mafic volcanic units. More detailed geologic mapping, soil geochemistry and induced polarization surveys were recommended.

(29) Highbourne Explorations Limited

Letang Claim Gp. (473006) 21 G/2W

This property is situated along Highway 772, between the villages of Letang and Back Bay, about 8 km south of the town of St. George. The property is underlain by Silurian, intensely deformed, mafic and felsic metavolcanic rocks, pelitic metasediments and mafic intrusive rocks. Small amounts of copper were produced from the Wheal Louisiana Mine, which operated in this area around 1865.

Interest in the Letang area has been revived in recent years because gold is associated with the base metal sulphides. A soil geochemical survey conducted by Highbourne confirmed the presence of gold on the property. About 2% of the collected samples showed in excess of 100 ppb Au. The geology of the property was mapped in detail, and magnetic and VLF-EM surveys also were carried out. Several conductors were delineated and one of these correlates with a magnetic ridge about 2000 gammas above background.

(31) Derek Brown

Jake Lee Brook Claim Gp. (473033) 21 G/2E

The Jake Lee Brook Prospect is north of the village of Pennfield, about 50 km west of the city of Saint John. The area is underlain by Silurian, intensely deformed, mafic and felsic volcanic rocks and metasediments. These rocks are intruded by Mississippian granite of the eastern St. George Batholith, in the northern part of the property and by gabbro and diorite farther to the south.

New Jersey Zinc conducted a stream sediment geochemical survey over the ground around 1968. In 1976, Essex Minerals staked 60 claims in the area and conducted soil geochemical, magnetometer and EM Surveys. D.F. Brown collected silt samples and rock chips, which were analyzed for Cu, Pb, Zn, Ag and Au. Geochemical analyses of anomalous samples yielded 600-720 ppm zinc, 200-750 ppm lead and 189-220 ppb Au.

(32) Lac Minerals Ltd.

Annidale Claim Gp. (473070) 21 H/13W

Lac Minerals conducted VLF-EM and magnetic surveys on their claim group, about 20 km west of the town of Sussex. The area is underlain by Silurian mafic volcanic and sedimentary rocks that are intruded by Devonian gabbro. Several well defined anomalies were delineated. About 6 km of induced polarization work was recommended to verify the validity of the most important electromagnetic anomalies.

(27) Appalachian Resources, Inc.

Blueberry Mountain Claim Gp. (473036) 21 G/3E

Appalachian Resources conducted a soil-geochemical program for Cu, Zn, Pb, and Au over the Middle Devonian mafic and felsic intrusive rocks in the western St. George Batholith. The area was explored for gold, because of a strong arsenic anomaly that was detected in stream sediments from the area. The anomaly probably reflects arsenopyrite-bearing quartz-carbonate veins that cut the intrusive complex. A soil sampling program delineated a northwest-trending anomalous gold-arsenic zone.

(28) Acadia Minerals Ventures Ltd./M. Stewart

(a) Bonny River South Claim Gp.
(South Pleasant Ridge area) (472991) 21 G/7W

The South Pleasant Ridge claim group of Acadia Minerals covers the contact of the Middle Devonian, western St. George Batholith (Magaguadavic Granodiorite) and Silurian metasediments in the southern part of Pleasant Ridge. The Early Carboniferous Pleasant Ridge Granite Stock is exposed north of the property.

Acadia collected 417 B-horizon soil samples at 100 ft. intervals along east-west claim lines. All samples were analyzed for Cu, Pb, Zn and Sn. No anomalies were detected. It was suggested by the company that heavy mineral separates from basal till would have been more reliable in this area of heavy overburden.

(2) Kidd Creek Mines Limited

(j) Beech Hill Claim Gp. (472999, 473052) 21 G/7W

This claim group covers the Early Carboniferous Beech Hill Stock, about 8 km west of Mount Pleasant. The Beech Hill Stock intrudes Silurian, intensely deformed greywacke and slate of the Waweig Formation. The metasediments in the contact zone were explored for tin- and base metal sulphide-bearing veins, but no mineral concentrations of economic interest were found.

Magnetic, electromagnetic, geology and geochemistry surveys were reported.

CALEDONIA ZONE

(33) V.N. Rampton (Gleeson-Rampton Explorations)

(a) East Wolf Island Claim Gp. (473123) 21 B/10

East Wolf Island is one of a group of islands referred to as the Wolves, about 10 km south of Beaver

Harbour. The islands are underlain by hornblende-biotite granite, which is intruded by mafic dykes. The island was staked because of its close proximity to the Cobequid Fault Zone. Gold-bearing granites occur north of this fault along the Bay of Fundy coast.

Pyrite, hematite and chlorite are abundant along a prominent shear zone. Five samples collected along this shear zone yielded anomalous gold and copper (up to 597 ppb Au and 758 ppm Cu).

(b) Ross Island Claim Gp. (473129) 21 B/10

Ross Island is in the eastern part of Grand Harbour, adjacent to Grand Manan Island, in the Bay of Fundy. The southern part of the claim group is underlain by mafic volcanic rocks and intercalated conglomerate of Late Precambrian or Early Paleozoic age. The northern part is underlain by quartzite, argillite and slate that previously have been correlated with the Precambrian Green Head Group.

A prominent alteration zone characterized by silica, chlorite, sericite and carbonate was found in the contact zone of the volcanic and metasedimentary units. Small amounts of pyrite and chalcopyrite occur in quartz veins within this zone. Anomalous amounts of gold (up to 18 ppb Au; background >1 ppb Au) are associated with the pyrite- and chalcopyrite-bearing veins.

(c) Kent and Sheep Island Claim Gp. (473122) 21 B/10

Kent and Sheep Islands are part of a group of islands known as Three Islands, southeast of Grand Manan Island.

Sheep Island is underlain by leucogranite, which is intruded by massive mafic dykes. Similar intrusive rocks occupy most of Kent Island. In this area, the granite is locally intensely sheared and cut by quartz veins. Abundant magnetite appears to be related to emplacement of the mafic dykes.

Representative samples were collected from various rock types, alteration zones and veins. The highest gold value (17 ppb Au) was obtained from a magnetite-carbonate breccia on the west coast of Kent Island. Three samples from the magnetite zone yielded anomalous tin and tungsten (up to 20 ppm Sn and 276 ppm W).

(d) Roach Creek Claim Gp. (472997) 21 G/1W

The Roach Creek claim group extends from the Chance Harbour area, along the Bay of Fundy coast, westward into the Dipper Harbour area. The oldest rocks in the claim group are mafic and felsic volcanic rocks of the Late Precambrian Coldbrook Group. The Coldbrook rocks are intruded by porphyritic granite and diabase of Devonian or older age. The

volcanic and intrusive rocks are unconformably overlain by Carboniferous limestone and clastic sedimentary rocks.

Quartz veins occur locally in shear zones in the volcanic rocks. The host-rocks adjacent to the veins are altered by silicification, epidotization and carbonatization. Pyrite is present in varying amounts. Geochemical analyses of humus samples over two of these shear zones yielded distinct gold anomalies. The gold content in the anomalous humus samples varied between 12 and 19 ppb Au. Background values are less that 2 ppb Au.

(e) Chance Harbour Claim Gp. (472986) 21 G/1W

The Chance Harbour claim group extends from Chance Harbour eastward, along the Bay of Fundy coast. The bedrock units recognized here are similar to those in the Roach Creek area.

Three altered zones characterized by carbonate, silica and chlorite were found. Pyrite, chalcopyrite, malachite and hematite occur mainly within and along quartz veins in highly sheared volcanic rocks. Humus sampling delineated a well-defined gold anomaly, with values ranging from 4 to 358 ppb Au, along the western boundary of the claim group.

(1) Brunswick Mining and Smelting Corporation Limited

(s) Musquash Joint Venture Claim Gp. (473110) 21 G/1W

The claim group extends westwards from Hepburn Basin, about 15 km southwest of Saint John. The oldest rocks in the area are Precambrian or younger granodiorite and quartz diorite. These are intruded by granite porphyry and diabase. The intrusive rocks are unconformably overlain by Mississippian limestone of the Windsor Group and Pennsylvanian clastic sedimentary rocks. The porphyry copper-gold occurrence of Newbrun Resources is immediately south of the claim group.

About 500 soil samples were collected and analyzed for Cu, Pb, Zn, Ag and Au. No significant gold values were detected on the property. Anomalous zinc values were found near the Mississippian limestone. Farther south, at Gooseberry Cove, sphalerite has been found in similar rocks.

(t) Liberty Hill Claim Gp. (473116) 21 G/1W

The claim group covers the faulted contact between Precambrian or younger granodiorite and Pennsylvanian clastic sedimentary rocks. A small, high silver-base metal sulphide mineralized zone occurs west and east of a northwest-trending fault. Small amounts of molybdenite occur locally near a fault in the granodiorite.

Soil samples were collected to determine a southwest extension of the mineralized zone. Previous soil sampling by J.J. Dolan suggested that the mineralized zone extended to the northeast but this was not tested by diamond drilling.

(u) Emerson Creek Claim Gp. (473097) 21 H/5E, 5W

The Emerson Creek claim group is 24 km east of the city of Saint John, along the Bay of Fundy coast. The oldest rocks in the area are mafic and felsic volcanic and sedimentary of the Late Precambrian Coldbrook Group and granodiorite and granite of Precambrian or younger age, which are unconformably overlain by Carboniferous clastic sedimentary rocks. The northeastern extension of the Millican Lake Fault cuts across the claim group. The most extensive rock alteration in the property was found northwest of this fault, near Emmerson Creek, where fractured granite is sericitized, chloritized and carbonatized. Pyrite and chalcopyrite are disseminated in this altered zone.

In 1984, soil geochemical, magnetometer and VLF-EM surveys were carried out on the property. The VLF-EM survey detected the Millican Lake Fault. Mafic volcanic rocks were delineated from the magnetic survey. No significant geochemical anomalies were found in the property.

(v) Teahan Claim Gp. (473113) 21 H/10W, 11E

The Teahan Deposit is a low grade base metal sulphide deposit that occurs in Late Precambrian, highly deformed, mafic and felsic volcanic rocks and metasediments, immediately north of Fundy National Park. Copper was mined from the property during the 1880s. Interest was revived in the area because low-grade gold is locally associated with the deposit.

During 1984, the geology of the claim group was mapped in detail. Magnetometer, VLF-EM and Max-Min surveys were conducted over the deposit.

(34) Goldfluor Explorations Limited

Goldfluor Option (Little Dipper Harbour area) (473094) 21 G/1W

Brunswick Mining and Smelting optioned the Little Dipper Harbour Prospect from Goldfluor Explorations Ltd. The prospect is in Carboniferous sandstone and conglomerate that unconformably overlie Precambrian rhyolite of the Coldbrook Group. Gold- and base metal sulphide-bearing quartz-carbonate veins cut across the southern limb of a northerly overturned anticline. Effects of shearing are notable in the vicinity of the unconformity.

Brunswick Mining & Smelting trenched the area surrounding the discovery outcrop. Four short holes were drilled to test the continuity of the mineralized zone, but

only trace amounts of gold and base metal sulphides were intersected. VLF-EM, magnetometer, IP and soil geochemical surveys were also conducted on the property. One hole was drilled to test an IP anomaly that coincided with a weak soil anomaly. Only disseminated pyrite was intersected in this drill hole.

(35) Rex Silver Mines Ltd.

(a) Chance Harbour Claim Gp. (473125) 21 G/01W

The Chance Harbour claim group of Rex Silver is about 20 km southwest of Saint John, along the Bay of Fundy coast. The area is underlain by Late Precambrian mafic volcanic rocks of the Coldbrook Group, Precambrian or younger leucogranite and Carboniferous clastic sedimentary rocks. A 1983 reconnaissance survey detected anomalous amounts of gold near Falls Brook and north of Dipper Harbour. The mineralized rocks are silicified, sericitized, and carbonatized.

A sampling grid was laid out in the two anomalous zones. Magnetometer, VLF-EM and geochemical sampling surveys were carried out. In the Falls Brook area it was found that the VLF-EM anomalies reflected mainly surface features, but the magnetic survey was useful in delineating certain geologic units and silicified areas. Gold anomalies in rocks and soils generally coincided with magnetic highs about 600 gammas above background. The bog and soil sampling located anomalies yielding gold values between 10 and 575 ppb Au. In the Chance Harbour area the magnetic highs appear associated with Precambrian or younger leucogranite, which previously showed anomalous gold. Bog sampling has confirmed the presence of anomalous gold associated with the intrusion.

(b) Goose Creek Claim Gp. (473128) 21 G/1E, 1W

The Goose Creek claim group of Rex Silver is about 16 km southwest of Saint John, along the Bay of Fundy coast. The oldest rocks in the area are carbonates and clastics of the Precambrian Green Head Group, mafic volcanic and sedimentary rocks of the Late Precambrian Coldbrook Group, and granodiorite and granite of Precambrian or younger age. These rocks are unconformably overlain by Carboniferous carbonates and clastic sedimentary rocks.

Gold and small amounts of base metal sulphides occur mainly in quartz veins and stockworks in the Precambrian or younger granitic rocks. Base metal sulphide veins also occur locally in the Carboniferous carbonates.

In 1984, humus and B-horizon soil samples were collected over an altered zone in the claim group. The samples were analyzed for gold and silver. No significant anomalies were detected.

(c) Fairfield Claim Gp. (473089, 473126) 21 H/5E, 5W

The Fairfield claim group of Rex Silver is 17 km east of the Saint John airport and about 20 km northeast of Cape Spencer.

The claim group is underlain by highly deformed, mafic and felsic volcanic and clastic sedimentary rocks of the Late Precambrian Coldbrook Group and granitic rocks of Precambrian or younger age.

Anomalous gold values were found on the property during 1983. In 1984, a sampling grid was laid out over the anomalous zone. Magnetic, VLF-EM and Max-Min II surveys were conducted on the property. A magnetic anomaly was delineated, which appears to coincide with the contact zone of the hydrothermally altered granite.

(36) Peter Penety

(a) Pork Ledge Option (473109) 21 G/1W

The Pork Ledge claim group is midway between Chance Harbour and Musquash Harbour, 16 km west of Saint John, along the Bay of Fundy coast. The area is underlain by Carboniferous, highly deformed, clastic sedimentary rocks and Precambrian or younger granite. The granite is locally highly fractured, silicified, sericitized and carbonatized.

In 1983, trace amounts of gold were found in several localities in silt samples collected from streams draining the property. During the 1984 field season, the eastern part of the claim group was mapped in detail and a VLF-EM survey was done to detect possible conducting gold-bearing sulphide zones. A geochemical sampling program of bog sediments was also carried out. A gold anomaly was found in the vicinity of a brook that yielded stream sediments assaying 192 ppb Au.

(b) Musquash Harbour Option (473101) 21 G/1W

The claim group is at the head of Musquash Harbour, about 16 km west of Saint John. The ground was optioned by Rex Silver Mines Ltd.

The area is mainly composed of Precambrian or younger granodiorite, quartz-diorite and granite that are unconformably overlain by Carboniferous clastic sedimentary rocks. Diabase dykes are locally abundant. Some of the granitic rocks are highly sheared, sericitized, silicified and carbonatized. Pyrite, chalcopyrite, bornite, galena and hematite are common in these rocks.

During 1984, the geology of the claim group was mapped, and bog and soil samples were collected. Two of the twenty-four bog samples yielded anomalous amounts of gold (8 and 14 ppb Au). Five anomalous soil samples yielded assays between 31 and 345 ppb Au.

(37) Newbrun Resources Inc.

Gooseberry Cove Claim Gp.
(West Musquash Harbour area) (473065) 21 G/01W

Newbrun Resources holds a claim group that covers a Precambrian or younger gold-base metal sulphide-bearing granite porphyry on the west side of Musquash Harbour. The granite porphyry intrudes granodiorite. The granodiorite intrudes Precambrian carbonates of the Green Head Group and mafic and felsic volcanic and sedimentary rocks of the Coldbrook Group. A grid was established on the property and the geology was mapped in detail. Magnetic and VLF-EM surveys were conducted, and soil samples were collected for geochemical analysis. Anomalous amounts of gold, ranging from 9 to 135 ppb Au, were detected in soils.

(38) Gordex Minerals Limited/Morton Gordon

(a) Cape Spencer Property, M.L. 1274
(473038) 21 H/4W

The Cape Spencer gold deposit is about 400 m west of the lighthouse at Cape Spencer, southeast of Saint John. The gold-bearing zone was delineated by trenching and diamond drilling. The host rocks are mainly Carboniferous, highly deformed, arkosic sedimentary rocks. The gold is mostly in pyrite that occurs in highly argillitized rocks adjacent to quartz veins that comprise extensive stockworks. Gold also is associated with hematite in cross-cutting quartz veins.

Summary reports on diamond drilling results and an ore reserve calculation were prepared. It was estimated that 473,910 tonnes grading 3.291 g/t (0.096 oz/ton) Au could be mined from an open pit operation to a depth of 30.5 m (100 feet). The property has potential reserves of 2.7-3.6 x 10^6 tonnes (3-4 million tons) to a depth of 152.4 m (500 feet). Plans have been announced recently for a cyanide heap leach plant to recover the gold.

(b) Millican Lake East (473045) 21 H/4W

This claim group borders on the southeast shore line of Millican Lake, about 15 km southeast of Saint John. The major rock units in the area are Precambrian or younger granite and granodiorite that are unconformably overlain by Carboniferous clastic sediments similar to those at Cape Spencer. Quartz veins are abundant in the property.

At the time of writing this report, no detailed prospecting had been done on the property, although the geology is favourable for precious metals. The rocks adjacent to the quartz injection zone, particularly, merit detailed exploration for precious metals.

(c) West Beach Claim Gp.
(Beveridge Cove area) (473069) 21 H/4W

The Beveridge Cove gold prospect is about 8 km northeast of Cape Spencer and 18 km southeast of Saint John. The oldest rocks in the area are mafic volcanic and sedimentary rocks of the Late Precambrian Coldbrook Group that are thrust over Cambrian or younger, highly deformed metasediments. The metasediments are in faulted contact with Precambrian or younger granite. The granite is intensely sheared, argillitized, sericitized and silicified. Hematite is locally abundant along a prominent fault. Small amounts of gold, 0.69-2.74 g/t (0.02-0.08 oz/ton) Au, were found in hematite-rich quartz that occurs where a northeast-striking fault cuts the granite.

A VLF-EM survey and soil sampling were done on the claim group. Several 10 L till samples were panned down to about 30 g of heavy mineral concentrate. Eight concentrates panned from fluvial sands and gravels yielded two highly anomalous gold values.

(40) H.C. McNamara

Cape Spencer Property, M.L. 1347
(Millican Lake area) (473004, 473111) 21 H/04W

The Millican Lake prospect is about 1 km northeast of Cape Spencer and joins the Gordex claim group. The oldest rocks in the area are Late Precambrian, highly deformed, mafic volcanic and clastic sedimentary rocks that are intruded by granitic rocks of Late Precambrian or younger age. The granitic rocks are unconformably overlain by intensely deformed arkosic conglomerate and sandstone of Carboniferous age, similar to the rocks in the main mineralized zone of the Gordex ground.

An extensive quartz stockwork intrudes the granite and Carboniferous sedimentary rocks southeast of Millican Lake. Along the southern margin of this quartz stockwork zone, gold-bearing pyritiferous rocks similar to those on the Gordex property have been discovered by trenching.

Gold also has been panned from sand and gravel deposits within and south of Millican Lake. A preliminary study to investigate the possibility of recovering placer gold from the lake was also conducted.

(39) J. Newhouse

(a) Black River Claim Gp. (473088) 21 H/5W

The claim group is about 12 km northeast of the Cape Spencer gold deposit. The oldest rocks in the area are Late Precambrian mafic and felsic volcanic and sedimentary rocks of the Coldbrook Group, which are intruded by Precambrian or younger granite and granodiorite. The granite is

locally unconformably overlain by Mississippian, argillaceous limestone of the Windsor Group. Both the Coldbrook Group and the granite are unconformably overlain by Pennsylvanian arkosic sandstone and conglomerate similar to Cape Spencer.

In 1984, the area was prospected. Silt and soil samples were collected for geochemical analysis and a VLF-EM survey was conducted on the property. Although the geology of the property appears favourable for gold mineralization, only one anomalous silt sample, assaying 69 ppb Au, was found.

(b) Sinclair Hill Claim Gp. (473031) 21 H/10W

The claim group is about 25 km north of Alma, a village on the Bay of Fundy coast. Late Precambrian felsic volcanic rocks are the most abundant in the area. Within this sequence is a cream- to rusty-colored tuff that contains between 5 and 30% pyrite. Disseminated pyrite and chalcopyrite are exposed in a gravel pit. During 1984, the geology of the property was mapped in detail.

(41) Cuvier Mines Inc.

Black River Claim Gp. (473078) 21 H/4W, 5W

The claim group is west of Black River and extends to the Bay of Fundy coast, about 12 km southeast of Saint John. The Cape Spencer gold deposit is about 5 km southwest of the claim group. The ground was staked soon after the discovery of gold-bearing float by Cuvier Mines in 1982. A chalcopyrite-bearing fracture zone assaying 1.91% copper over 2 m was discovered in the area during 1968.

The claim group is underlain by Late Precambrian mafic volcanic and sedimentary rocks of the Coldbrook Group. Precambrian or younger granodiorite and granite intrude the Coldbrook Group. Carboniferous clastic sedimentary rocks similar to those at Cape Spencer overlie the two older rock units in the property. All the rocks in the claim group are highly deformed and they are cut by northeasterly striking faults.

Soil geochemical, magnetic and VLF-EM surveys were conducted on the claim group. Conductors that roughly parallel the northeasterly striking Armstrong Brook Fault were drilled in nine localities. Zones of intense rock alteration and disseminated pyrite were intersected, but no significant gold values were found. The bedrock source of the gold-bearing float on the property, therefore, remains unknown.

(5b) Mactaquac Mining Ltd.

Vernon Mine Claim Gp. (473016) 21 H/11E

The claim group is immediately west of Fundy National Park and it includes the workings of the 'Old Vernon Copper Mine'. Exploration was conducted under an option

agreement with U.S. Borax Ltd. The area is underlain by Late Precambrian mafic and felsic volcanic rocks, arkosic metasediments and granite. The ground was staked because gold was found in the old mine area around 1865.

Soil geochemical and VLF-EM surveys and a limited amount of diamond drilling were done. Anomalous amounts of gold (200-300 ppb Au) were intersected within copper-silver-bearing quartz-carbonate veins.

(28) Acadia Minerals Ventures Ltd./M. Stewart

(b) Blackwood Lake (473124) 21 H/10W

The Blackwood Lake group of Acadia Minerals Ventures is northeast of the 'Old Teahan Mine', north of Fundy National Park. The area is underlain by Late Precambrian, highly deformed, felsic and mafic volcanic rocks and metasediments of the Coldbrook Group. The ground was staked because of old reports that mentioned visible gold in streams from this area. Panning of Keirstead and Barrett Brooks during 1984 confirmed the presence of free gold. This work will be followed up by detailed panning of streams and glacial tills. Magnetic and VLF-EM surveys are planned to assist in mapping the geology because outcrops are sparce in the area.

(42) W. Burton

Little Stream (473144) 21 H/10W

The Little Stream claim group is along the road between Albert and Alma, 15 km east of Fundy National Park. The prospect is underlain by Precambrian or younger granite and granodiorite and clastic sedimentary rocks. Silicified, sericitized and carbonatized equivalents of both rock types were analyzed and yielded up to 366 ppm Au and 3000 ppm Cu. Soil samples collected over the altered zone assayed up to 400 ppb Au and 200 ppm Cu. Some trenching was done to expose the altered zone.

MONCTON-CUMBERLAND BASIN

(43) A.W. Lockhart

Sussex Silica and Aggregate Claim Gp. (473023) 21 H/12E

This high-grade silica deposit is immediately east of Cassidy Lake and 7 km east of the Denison-Potacan Mine. A drilling program conducted in the deposit proved silica aggregate reserves to be 16.7 million tonnes assuming a mineable thickness of 15 m.

MINERAL OCCURRENCES

Mineral occurrences described below are those which have been worked on in 1984 (figure 10). For the properties described in previous issues of this report, only the additional information is provided here.

Annidale Copper-Gold 21 H/13

LOCATION The Annidale copper deposit is about one mile south of Annidale, Kings County.

COMPANY The property is presently held by M.J. Grant and W.G. Walton.

DEVELOPMENTS The property was optioned by Lac Minerals Ltd. and some diamond drilling was carried out in the gold-bearing chromium-mica zone. The results were disappointing and the company dropped the option.

For additional information see Information Circular 84-1.

Canoe Landing Lake Zinc-Lead-Silver 21 O/8E

COMPANY Clearwater Mines Limited, P.O. Box 520, Bathurst, New Brunswick E2A 3Z1. I.C. Stairs is president.

DEVELOPMENTS Brunswick Mining and Smelting Corporation Limited has not renewed its option. The property has reverted to Clearwater Mines Limited.

For additional information see Information Circular 84-1.

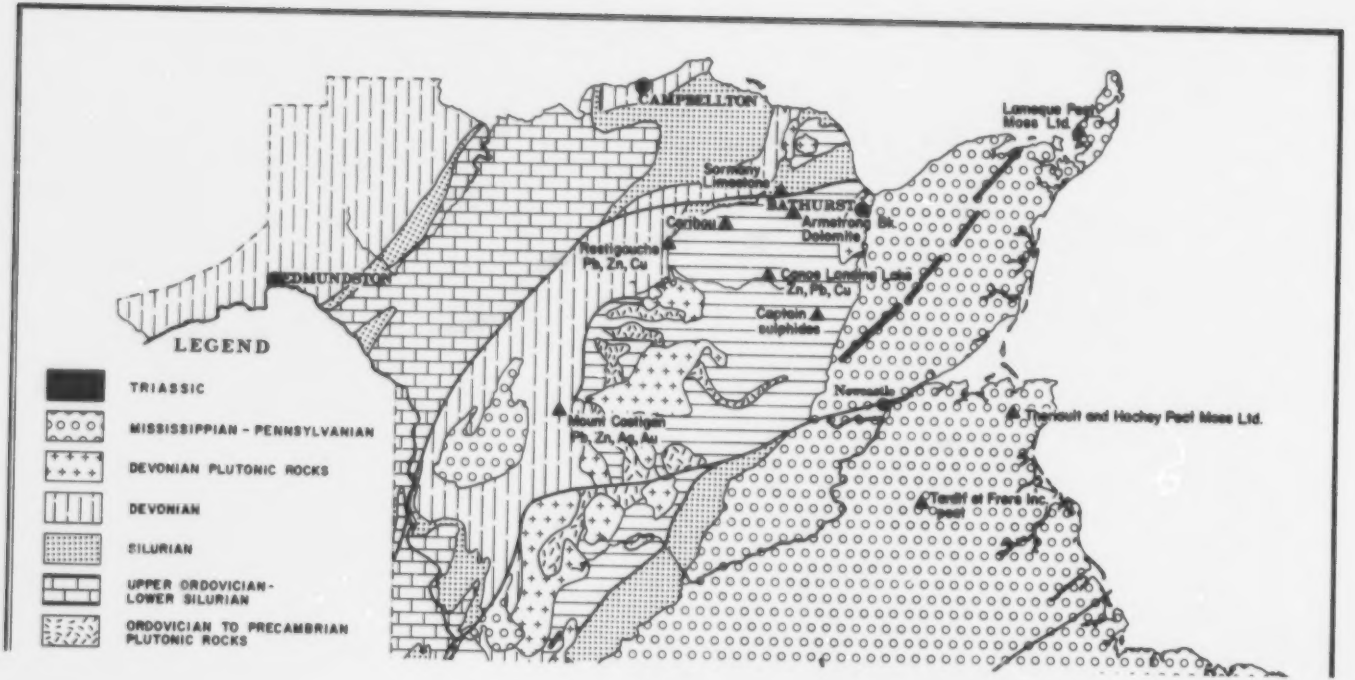
Cape Spencer Gold 21 H/4W

LOCATION The Cape Spencer gold deposit is about 10 km southeast of Saint John, Saint John County, along the Bay of Fundy coast.

COMPANY The property is held by Gordex Minerals Ltd. Mr. Morton Gordon is manager of this company.

DEVELOPMENTS A survey grid was established, the geology was mapped in detail and bulk samples were collected for analysis by Noranda Exploration Ltd.

For additional information see Information Circulars 83-2 and 84-1.


CAMPBELLTON
Lameque Peat Moss Ltd.
Sormeny Limestone
BATHURST
Armstrong Bt.
Dolomite
Caribou
Restigouche Pb, Zn, Cu
EDMUNDSTON
Canoe Landing Lake Zn, Pb, Cu
Captain sulphides
Newcastle
Mount Costigan Pb, Zn, Ag, Au
Theriault and Hachey Peat Moss Ltd.
Tardif et Frere Inc. peat
LEGEND
TRIASSIC
MISSISSIPPIAN - PENNSYLVANIAN
DEVONIAN PLUTONIC ROCKS
DEVONIAN
SILURIAN
UPPER ORDOVICIAN - LOWER SILURIAN
ORDOVICIAN TO PRECAMBRIAN PLUTONIC ROCKS

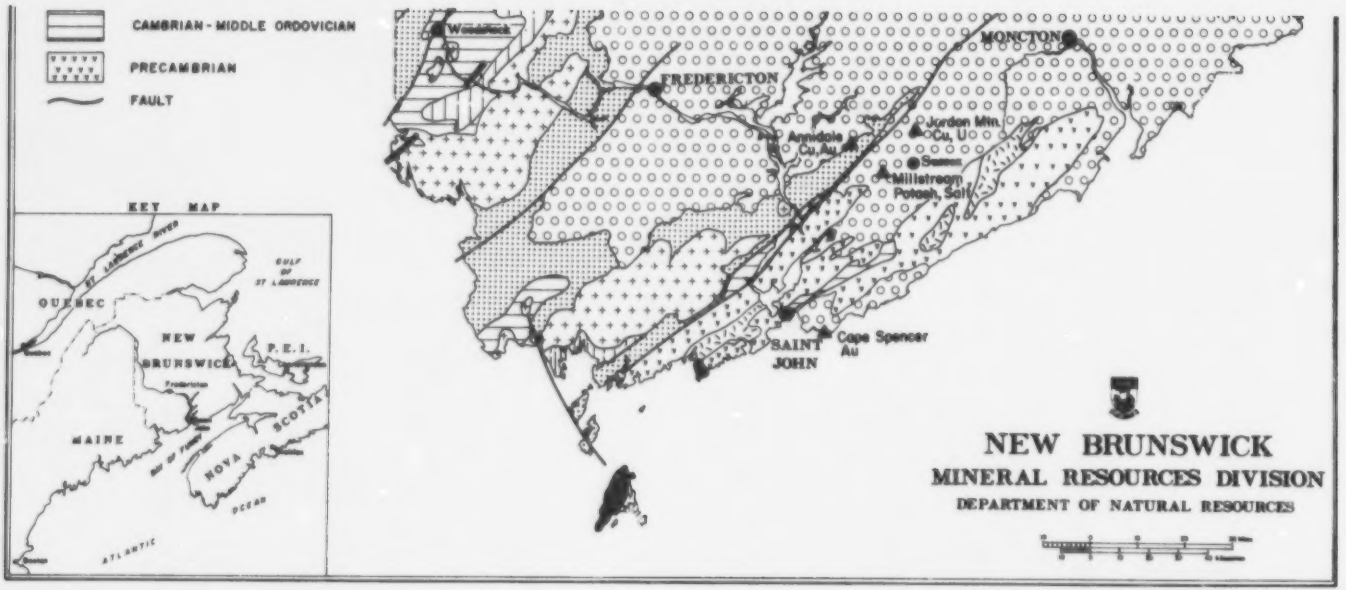


Figure 10. Location of metallic and non-metallic mineral occurrences in New Brunswick.

Captain Sulphide Deposit 21 P/5W

COMPANY Brunswick Mining and Smelting Corporation Limited.

DEVELOPMENTS Property explored in 1984 (see p. 42 of this report).

For additional information see Open File Report 82-31 and Information Circulars 83-2 and 84-1.

Caribou Deposit (Anaconda) 21 O/9W

LOCATION The Caribou deposit is approximately 40 km west of Bathurst (Lat. 47°34'N; Long. 66°17.6'W) in Restigouche County.

HISTORY The mineralization was discovered in late 1955 by Anaconda Copper Mining Company. Anaconda excavated an adit in the late fifties and in the late sixties. In the early seventies, an incline was driven from the adit. Coincidentally, a 907 tonne/day mill with a copper concentrator was constructed. Mining of secondary (near surface) copper took place between November, 1970 and November, 1971. Shutdown resulted from metallurgical problems. Production resumed in September, 1973 and continued for one year. In 1983, heap leaching of gossan was completed. Gold and silver extracted in 1983 amounted to 88 582.77 g and 1 688 018 g, respectively. The property was not in production in 1984.

COMPANY Caribou-Chaleur Bay Mines Limited, 260 8th Street, Toronto, Ontario M8V 3E1. The president is R.L. Sinclair. Anaconda Canada Limited 67.5%, Cominco Limited 22.5%, Chaleur Bay Syndicate 10.0%, Caribou-Smith M.L. (east part of sulphide body), controlled by Anaconda Canada Limited.

RESERVES (December, 1984)

	Tonnes	Cu%	Pb%	Zn%	Ag (g/t)	Au (g/t)
Proven	3 500 000	0.36	1.68	4.40	49	0.94
Indicated	33 454 000	0.36	1.68	4.40	49	0.94

DEVELOPMENTS Environmental and site maintenance work constituted the main activities during the year. Hydroseeding of 5.5 ha (13.7 acres) was completed during the month of July with an estimated 70% of the area showing new vegetation.

EMPLOYEES At year-end 1984, there were three employees at this site.

For additional information see Information Circular 84-1, p. 46.

Jordan Mountain Copper-Uranium 21 H/14W

LOCATION This group of claims is situated at Jordan Mountain, about 12 km north of Sussex, Kings County.

COMPANY The claims are held by James Colucci.

DEVELOPMENTS James Colucci conducted a limited diamond drilling program on the property.

For additional information see Open File Report 82-31.

Mount Costigan Lead-Zinc-Silver-Gold 21 J/14

DEVELOPMENTS Three drill holes were put down in the breccia pipe, and seven holes were drilled in surrounding targets (see page 56 of this report).

For additional information see Information Circular 84-1.

Restigouche Zinc-Lead-Copper Deposit 21 O/7, 10

DEVELOPMENTS The property was taken over by Lincoln Resources, who can acquire Placer Development's interest in the deposit by spending $1.6 million. Gowganda Silver Mines has a 25% net proceeds interest.

For additional information see Information Circulars 83-2 and 84-1.

NON-METALLIC MINERALS[1]

Three companies: Tardif et Frere, Theriault and Hachey, and Lameque Peat Moss Ltd. held peat exploration licences in 1984. By the year's end it appeared that only the latter two would proceed to peat leases, with Tardif et Frere dropping their licence.

BP Resources Canada Ltd. completed a shaft pilot hole and by December 1984 was nearing completion of predevelopment plans, which are required in making any application for a mining lease.

Elmtree Resources Ltd. continued exploration on the high-grade calcic limestone deposit at Sormany, although other plans for quarrying the Armstrong Brook dolomite have been delayed due to crushing difficulties (figure 10).

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1 Written by D.E. Barnett, R. Shaw and T.C. Webb

PEAT

Tardif et Frere Inc.

COMPANY Tardif et Frere Inc., 62 Boulevard Cartier, Riviere du Loup, Quebec G5R 3Y4. The President is Jean R. Tardif, and the General Manager is Clarence Breau.

RIGHTS Peat Exploration Licence 82-5 (426 ha) on Bog No. 16, under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 16 is adjacent to Route No. 126, 3 km south of Rogersville, Northumberland County.

HISTORY Tardif et Frere acquired the Exploration Licence 82-5 in 1982.

RESERVES AND GRADE 6.15 Mm^3 of surficial and 2.53 Mm^3 of humified peat on total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	426	33	459
>1 m	271	12	283

DEVELOPMENT 1984 Nil.

OUTLOOK Company has indicated that it will not be converting to a lease.

Theriault and Hachey Peat Moss Ltd.

COMPANY Theriault and Hachey Peat Moss Ltd., R.R.# 1, Baie Ste. Anne, Northumberland County, New Brunswick E0C 1A0. Telephone: (506) 228-4530. The President is Isaac Theriault.

RIGHTS Peat Exploration Licence 82-1 (233 ha) on Bog No. 302A, under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 302A is 7 km south of Eel River Bridge, Northumberland County.

HISTORY Theriault and Hachey acquired Exploration Licence 82-1 in 1982.

RESERVES AND GRADE 3.56 Mm^3 of surficial and 0.40 Mm^3 of humified peat on total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	233	Nil	233
>1 m	145	Nil	145

DEVELOPMENT Completed exploration and preparing to have surveyed.

OUTLOOK Company will be converting to a Peat Lease in 1985 as well as dropping part of Peat Lease No. 11 presently under production.

Lameque Peat Moss Ltd.

COMPANY Lameque Peat Moss Ltd., P.O. Box 570, Lameque, New Brunswick E0B 1V0. The manager is Florent Chiasson.

RIGHTS Peat Exploration Licence 84-1 (63 ha) on Bog No. 578, under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 578 is 2 km north of Petite-Lameque, Gloucester County.

HISTORY Lameque Peat Moss Ltd. acquired the Exploration Licence 84-1 in 1984.

RESERVES AND GRADE 0.85 Mm^3 of surficial and 0.21 Mm^3 of humified peat on total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	63	22	85
>1 m	45	11	56

DEVELOPMENT Since acquisition in 1984 the company has prepared an access road and completed exploration.

OUTLOOK Company has indicated that it will be applying for a peat lease in preparation for bringing the bog into production.

POTASH/SALT

Millstream 21 H/12

COMPANY BP Resources Canada Ltd. - Selco Division, 55 University Avenue, Suite 1700, Toronto, Ontario M5J 2H7. The general manager is J. Hainey.

RIGHTS 10,118 ha Exploration Agreement, under Section 15(2) of Mining Act, Chapter M-14, R.S.N.B. 1973.

LOCATION This property is located about 4 km east of Apohaqui (10 km east of Sussex), Kings County.

HISTORY A drill hole (Millstream No. 1), completed in 1973 by the Department of Natural Resources, penetrated about 12 m of potash-bearing salt at a depth of 915 m, before abandonment was caused by technical difficulties. In May 1980, the Province called for tenders for the right to explore and develop a salt-potash prospect at Millstream and five tenders were received. After careful evaluation, the Province awarded the rights to BP Exploration Canada Ltd., now BP Resources Canada Ltd.

Eleven drill holes and related geological studies investigated the property between 1981 and 1983. Results were extremely encouraging, encountering beds of potash mineralization at depths between 950 and 1,050 m.

PRESENT OWNERSHIP BP Resources Canada Ltd. - Selco Division.

RESERVES AND GRADE Anticipated tonnages and potash grades ranging from 20 to 30% K_2O are very encouraging.

PRODUCTION None.

DEVELOPMENT BP drilled a shaft pilot hole in 1984 and was subsequently granted a one-year extension to the exploration agreement in order to complete a prefeasibility study involving studies related to geology, mining methods, milling and marketing.

This study is to be submitted early in 1985 as part of the application for a mining lease under the terms of their exploration agreement.

EMPLOYEES Three.

OUTLOOK Following the successful conclusion of the mining lease, the company will probably undertake the sinking of an exploration shaft in order to further investigate the deposit before proceeding to a development decision. Such a decision could come as early as 1988. If results are favourable and potash production becomes a reality, it could result in over 400 permanent jobs.

LIMESTONE/DOLOMITE

Sormany (Limestone) 21 O/9

COMPANY Elmtree Resources Ltd., P.O. Box 665, Bathurst, New Brunswick E2A 3Z6. Telephone: (506)

546-6382. The Executive Officer and President is A. Buzas, and the Manager and Vice-President is G.M. Doucet.

RIGHTS 84.3 ha Quarry Lease No. 27 under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

163.5 ha Mining Licence No. 1345 and 16.2 ha Claim Block 993 under the Mining Act, Chapter M-1, R.S.N.B. 1973.

LOCATION The Sormany limestone deposit is located about 30 km west of Bathurst, adjacent to the Millstream River.

HISTORY Although the limestones near Sormany were first mapped by Davies in 1959, it was not until 1982, that Elmtree Resources Ltd. mapped and sampled the deposit in detail.

PRESENT OWNERSHIP Elmtree Resources Ltd.

RESERVES AND GRADES Results indicated an excess of 4,000,000 tonnes of high-grade calcic limestone (53.0% CaO) suitable for quicklime and hydrated lime production.

PRODUCTION Some stone was quarried and hauled to the main crushing facility at Elmtree where it was marketed as ag lime, and smelter flux (see Elmtree Resources Ltd., p. 126).

DEVELOPMENT Two holes were drilled to further test the extent and grade continuity of the limestone at depth. Results were encouraging enough to proceed with site preparation for quarry development. Some stone was hauled to the crushing facility at Elmtree where it was marketed as ag lime. A decision to construct a lime-burning kiln has been delayed.

EMPLOYEES Manpower provided by staff of Elmtree Resources Ltd.

OUTLOOK Quarrying to continue. Decision on installation of new equipment at existing processing plant has been delayed due to current market limitations.

Armstrong Brook (Dolomite) 21 P/12W

COMPANY Elmtree Resources Ltd., P.O. Box 665, Bathurst, New Brunswick E2A 3Z6. Telephone: (506) 546-6382. The Executive Officer and President is A. Buzas, and the Manager and Vice-President is G.M. Doucet.

RIGHTS 59.10 ha Quarry Lease No. 26 under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

161.1 ha Mining Licence No. 1344, under the Mining Act, Chapter M-1, R.S.N.B. 1973.

LOCATION The Armstrong Brook dolomite deposit is located about 22 km west of Bathurst, Gloucester County.

HISTORY The deposit was probably found several years, perhaps decades ago. It appears to have been used by local farmers, since the ruins of old kilns are present in the area. The deposit was apparently rediscovered by Anaconda geologists in the fifties while exploring for sulphide deposits. It was briefly investigated by J.W. McCarthy in the early seventies and later staked by Elmtree Resources Ltd. in 1982. An access road was constructed in 1983 and limited production for testing purposes was undertaken.

PRESENT OWNERSHIP Elmtree Resources Ltd.

RESERVES AND GRADES Exploration and development work, carried out by Elmtree Resources Ltd., has resulted in the delineation of an excess of 2,000,000 tonnes of dolomite grading up to 37% $MgCO_3$.

PRODUCTION None.

DEVELOPMENT Plans for the installation of additional crushing equipment to handle production of dolomitic ag lime and construction stone have been delayed.

EMPLOYEES Manpower provided by the staff of Elmtree Resources Ltd.

OUTLOOK Decision to go into production will be affected by market limitations; however, property appears capable of adequately supplying Mg requirements for northern New Brunswick, with savings recognized in government transport subsidy.

ENERGY RESOURCES[1]

Under an agreement with New Brunswick Oilfields, Chevron Resources Canada Ltd. continued a third year of seismic exploration on Licence to Search Nos. 80-1 to 80-29 in the Moncton and Cumberland Subbasins (figure 11). In the offshore area no further exploration took place in 1984, although several other companies 'farmed in' to offshore Licences 74-1 to 74-19. These companies now include: Chevron Canada Resources Ltd., Irving Oil Ltd., Gulf Canada Resources Inc., Canadian Hunter Exploration Ltd., Mobil Oil Canada Ltd., D.W. Axford and Associates Ltd., Canada Northwest Energy Ltd., East Coast Energy Ltd., and Inco Energy Resources Ltd.

Ranchman's Resources (1976) Ltd. continued to hold Licences 83-1 to 83-3 and completed geological and geophysical compilations.

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1 Written by D.E. Barnett, A.T. Martel

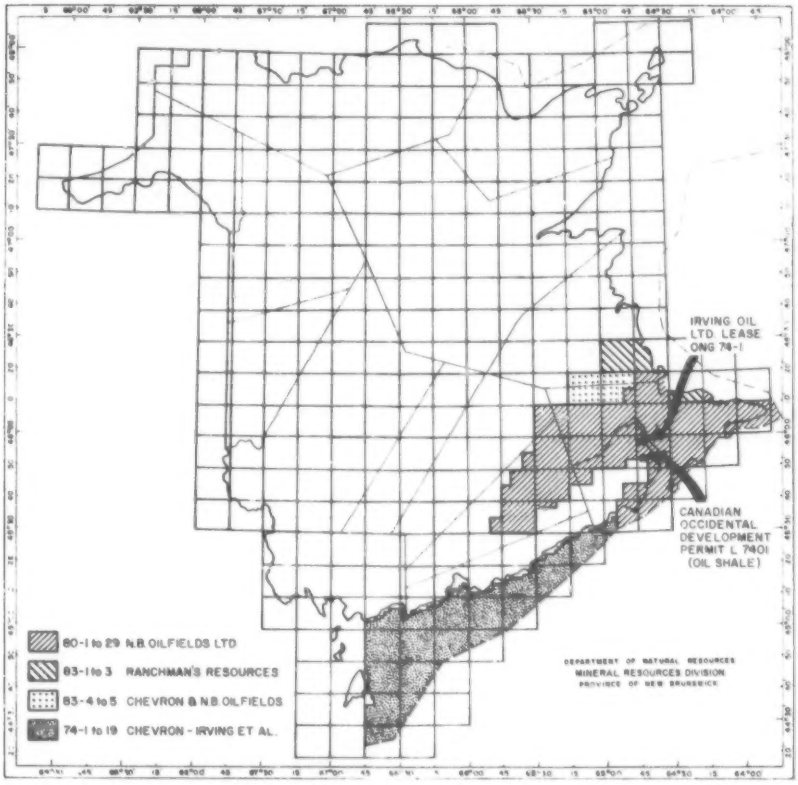

Figure 11. Location of oil shale development permit and oil and natural gas licences in New Brunswick.

OIL AND NATURAL GAS

Chevron Canada Resources Ltd.

COMPANY Chevron Canada Resources Ltd., 500-Fifth Ave. S.W., Calgary, Alberta T2P 0L7. Telephone: (403) 234-5000. The president is G.G.L. Henderson

RIGHTS Onshore Licences 80-1 to 80-29 (679,307 ha), and Licences 83-4 and 83-5 (66,210 ha).

Offshore Licences 74-1 to 74-19 (509,983 ha).

All licences are under the Oil and Natural Gas Act, Chapter O-2.1, R.S.N.B. 1976.

LOCATION Licences 80-1 to 80-29 include almost the entire Moncton and Westmorland Subbasins in addition to portions of the New Brunswick Platform where the Platform borders the Moncton Subbasin.

Licences 83-4 and 83-5 are located north of Moncton on the New Brunswick Platform.

The offshore licences 74-1 to 74-19 entail almost the entire New Brunswick portion of the Bay of Fundy.

HISTORY Chevron Canada Resources and Irving Oil Ltd. formed a partnership and farmed into the New Brunswick Oilfields Ltd. Licences to Search 80-1 to 80-29.

The partnership, in conjunction with New Brunswick Oilfields Limited, acquired Licences to Search 83-4 to 83-5 in 1983.

In the Bay of Fundy, Chevron Canada Resources and Irving Oil Ltd. farmed into the Mobil-Gulf Licences to Search 74-1 to 74-19.

EXPLORATION In the onshore licence, Chevron et al. shot 168.6 km of seismic in order to further delineate potential drill targets. No work was done on the offshore licences.

OUTLOOK Onshore - Chevron et al. plan to drill at least two wells in the Moncton Subbasin in 1985 and may plan additional wells based on their success.

Offshore - The Cape Spencer No. 1 well is being studied in order to assess the potential of the Bay of Fundy region.

Ranchman's Resources (1976) Ltd.

COMPANY Ranchman's Resources (1976) Ltd., 550, 500-5th Ave. S.W., Calgary, Alberta T2P 3L5. The President & Chief Executive Officer is N.J. Lashuk.

RIGHTS Licences 83-1 to 83-3 (64,878.3 ha) under the Oil and Natural Gas Act, Chapter O-2.1, R.S.N.B. 1976.

LOCATION Licence 83-1 is located approximately 25 km northeast of Moncton, while Licences 83-2 and 83-3 are located approximately 35 km north of Moncton.

HISTORY All three licences were acquired by Ranchman's Resources (1976) Ltd. in 1983.

EXPLORATION A geological and geophysical compilation of information relating to the Licences to Search has been completed. In addition, 292 gravity stations were read and the results interpreted.

OUTLOOK Ranchman's Resources plans to conduct a geochemical survey of their licences involving the analysis of hydrocarbon in air samples taken in and above the soil.

CHAPTER 3. MINE DEVELOPMENT IN NEW BRUNSWICK

METALLIC MINERALS[1]

Mine development was progressing at the Lake George antimony-gold property of Durham Resources Inc. Figure 12 shows the developing mine properties in New Brunswick in 1984.

Lake George Antimony-Gold

LOCATION The Lake George antimony mine is situated about 15 km north of Harvey Station, York County.

HISTORY Antimony sulphide was first discovered on the property in 1863. There was minor production between 1880 and 1884. The first major development that led to production occurred in 1969-1971.

COMPANY The mine is owned by Oakwood Petroleum and operates under the name of Durham Resources Inc. with head offices at 111 Richmond Street West, Suite 916, Toronto, Ontario M5H 2G4. Chairman and President of Durham Resources Inc. is R. Granger. Executive Vice President and Chief Operating Officer is H. Harbinson; Mine Manager is B. Bourgoin.

EMPLOYEES At the current time there are 36 employees on the site. This is expected to gradually increase to 100 persons at full production.

RESERVES (December, 1984) Indicated 850 000 tonnes 4.15% Sb.

PRODUCTION

	Tonnes mined	Average grade %	Concentrate produced-tonnes	Avg. % of Antimony in Concentrate	Kg of Antimony Concentrate
1974	45 357	5.23	3,733	65.67	2 451 502
1975	68 989	3.95	3,463	66.13	2 290 120
1976	74 293	4.34	4,361	65.97	3 876 999
1977	82 943	3.85	3,896	65.94	2 569 065
1978	85 244	3.50	3,880	65.58	2 544 546
1979	90 872	3.58	4,337	65.67	2 848 155
1980	81 915	3.09	3,463	66.86	2 315 400
1981	32 443	3.54	2,480	66.37	1 646 003

1 Written by J.J. Chandra

The mine ran out of ore in May, 1981 but prior to closing, an antimony ore zone was found in the downward extension of the Hibbard vein, between the 244 and 427 m (800- and 1400-foot) levels.

DEVELOPMENTS In early 1984 a decision was made to reopen the mine and dewatering of the workings commenced on May 18, 1984. The dewatering of the mine was completed in August and the sinking of the shaft began in September which, by year-end, has been deepened 51 m (166 feet) beyond the 259 m (850 foot) level. The mine will commence development production in the summer of 1985 and will reach design capacity by April, 1986. The company is also studying the possibility of further processing of its concentrates.

NON-METALLIC MINERALS[1]

Three companies, Burnt Church Peat Moss Co. Ltd., Malpec Peat Moss Ltd. and Gulf Peat Co. Ltd., were in a development stage in 1984. Gulf Peat has been experiencing financing difficulties and at one stage appeared close to reaching a sales agreement. Malpec Peat expects to be in production in 1985; no definite production date has been given for Burnt Church Peat.

Denison-Potacan Potash Company continued on schedule with construction of surface facilities at its Clover Hill potash mine (figure 13). The second shaft was nearing completion by year's end and the brine pipeline to the Bay of Fundy was complete (figure 14). Production is anticipated in July 1985.

Lockhart Exploration Services Ltd. continued development work on the high-grade silica deposit near Cassidy Lake. Silica was produced for market testing for silicon metal.

PEAT

Burnt Church Peat Moss Co. Ltd.

COMPANY Burnt Church Peat Moss Co. Ltd., P.O. Box 78, Shippagan, New Brunswick E0B 2P0. Telephone: (506) 336-2378. The Manager is Julien Mourant.

RIGHTS Peat Moss Lease No. 22 (202 ha) on Bog No. 353, under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 353 is located 3 km southwest of Burnt Church Northumberland County.

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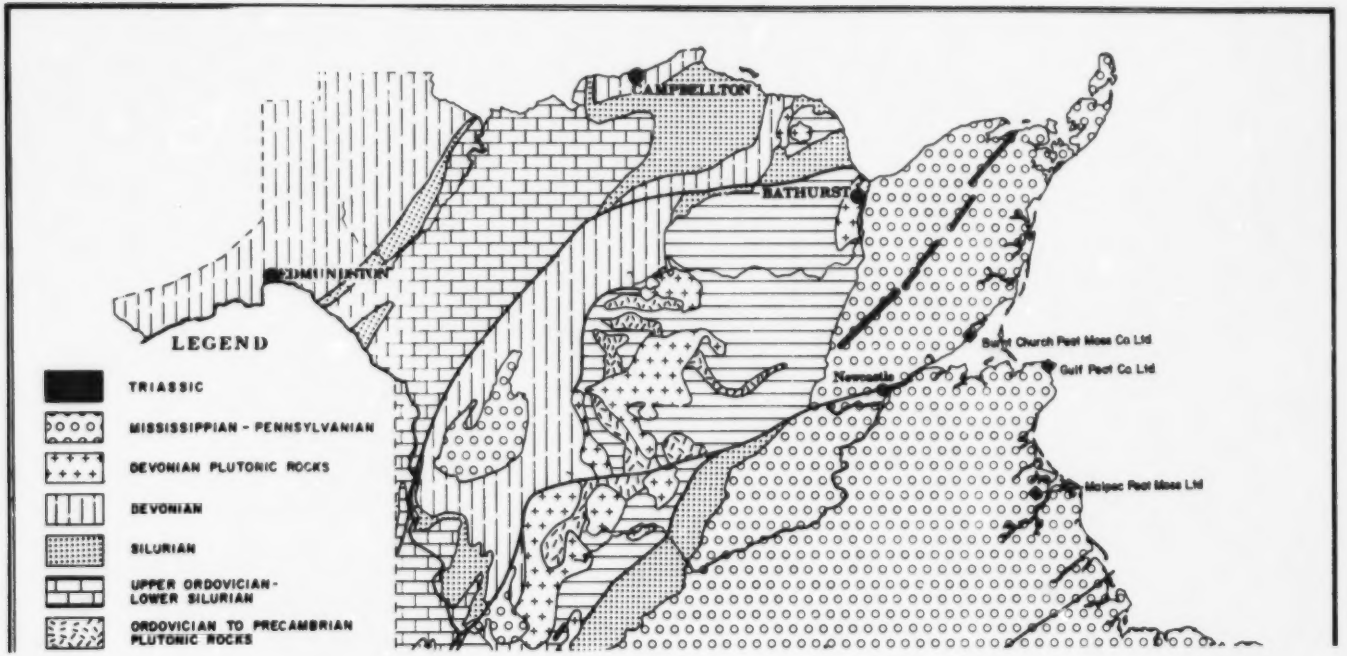
1 Written by D.E. Barnett, R. Shaw, T.C. Webb


CAMPBELLTON
BATHURST
EDMUNDSTON
LEGEND
TRIASSIC
MISSISSIPPIAN - PENNSYLVANIAN
DEVONIAN PLUTONIC ROCKS
DEVONIAN
SILURIAN
UPPER ORDOVICIAN - LOWER SILURIAN
ORDOVICIAN TO PRECAMBRIAN PLUTONIC ROCKS
Saint Church Peat Moss Co Ltd
Gulf Peat Co Ltd
Metpec Peat Moss Ltd

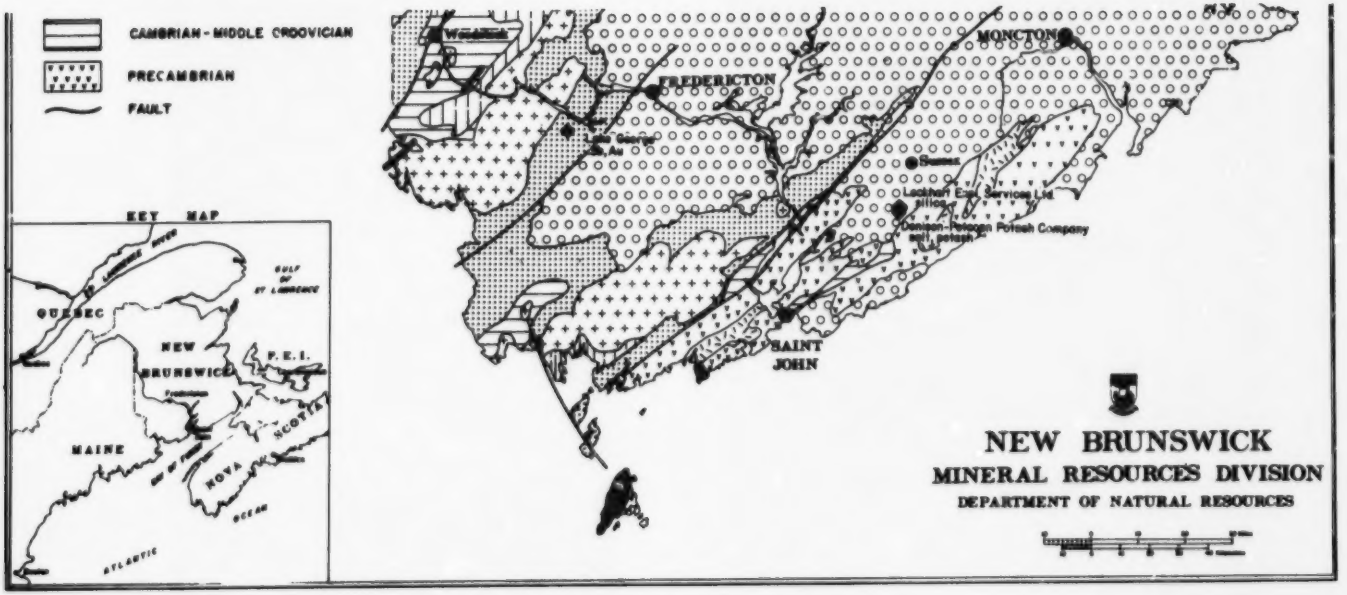


Figure 12. Developing mine properties in New Brunswick in 1984.

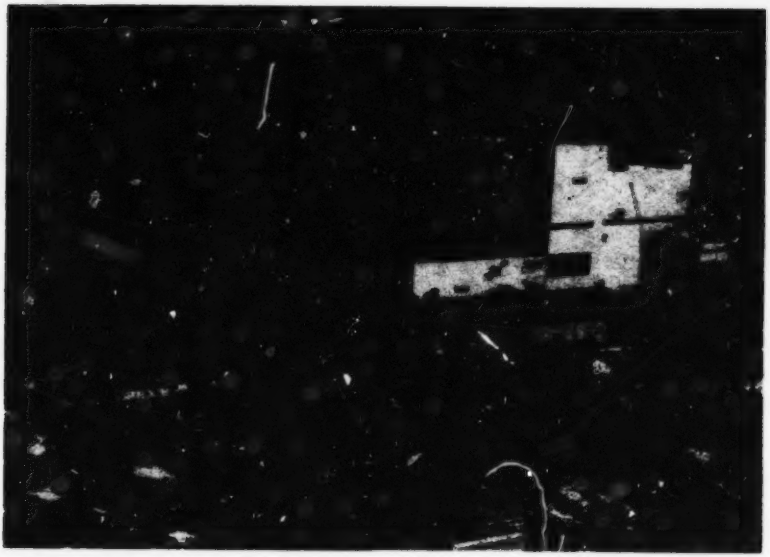


Figure 13. Denison-Potacan Potash Company mine site at Clover Hill, Kings County.

Figure 14. Pipeline which will carry brine from the Denison-Potacan mine at Clover Hill to the Bay of Fundy.

HISTORY Company acquired a Peat Exploration Licence in 1981 and converted to a Peat Lease in 1983.

RESERVES AND GRADE 9.26 Mm^3 of surficial and 1.06 Mm^3 of humified peat on total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	90	237	327
>1 m	67	188	255

DEVELOPMENT Nil.

OUTLOOK Preparation of bog for future production including possible plant construction.

Gulf Peat Co. Ltd.

COMPANY Gulf Peat Co. Ltd., c/o Mr. Robert Richard, R.R.. #1, Rogersville, New Brunswick E0A 2T0. The President is Lorraine LaBonté.

RIGHTS Peat Moss Lease No. 21 (734 ha) on Bog No. 338, under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 338 is located at Point Escuminac, 50 km east of Chatham, Kent County.

HISTORY Company was issued an Exploration Licence (No. P-1-77) on December 1, 1977 and converted to a Peat Lease (No. 21) on January 1, 1982.

RESERVES AND GRADE 22.80 Mm^3 surficial and 7.09 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	559	291	850
>1 m	501	164	665

DEVELOPMENT Attempts were made to sell the company in 1984, but without success. No developments took place in 1984.

OUTLOOK Bog 338 has good potential for production, but company has been experiencing finance problems.

Malpec Peat Moss Ltd.

COMPANY Malpec Peat Moss Ltd., P.O. Box 22, Neguac, New Brunswick E0C 1S0. Telephone: (506) 776-3411. The manager is Solomon Currie.

RIGHTS Peat Moss Lease No. 20 (248 ha) on bog No. 213 under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 213 is located 3 km west of Rexton, Kent County.

HISTORY Company was issued an Exploration Licence (No. 81-2) in January 1982 and converted to a Peat Lease (No. 20) that same year.

RESERVES AND GRADE 38.03 Mm^3 surficial and 5.0 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	1,777	488	2,265
>1 m	1,274	73	1,347

DEVELOPMENT Erected bagging facilities and offices.

OUTLOOK A section of this same Bog (Lease No. 20) is also used by Department of Agriculture for experimental farm plots. Company plans to commence peat production in 1985.

POTASH

Denison-Potacan Potash Company 21 H/12E

COMPANY Denison-Potacan Potash Company. P.O. Box 638, Sussex, New Brunswick E0E 1P0. Telephone: (506) 839-2146. The Executive Officer and President is C. Frame. The Project Manager is A.J. Kyle.

RIGHTS 8.887 ha Mining Lease, under Section 15(2) of Mining Act, Chapter M-14, R.S.N.B. 1973.

LOCATION Denison-Potacan Potash Company is located about 20 km southwest of Sussex, Kings County.

HISTORY The Salt Springs potash-salt deposit was discovered by the Department of Natural Resources in 1973. Subsequent exploration and development rights to a 120 km^2 reservation area were granted to International Minerals and Chemical Corporation (I.M.C.). Full-scale exploration involving 22 drill holes began in 1975, and was successful in confirming a significant ore body.

Despite extremely encouraging results of the drilling program, I.M.C. decided to sell the property to Denison Mines Limited of Toronto late in 1978. Construction of a 5 m diameter exploration mine shaft was commenced in September 1979 and reached a target depth of 835 m by 1982.

In December 1980, Denison Mines Limited assigned a 40% interest to the Potash Company of Canada Limited (Potacan). Potacan is owned jointly by Entreprise Miniere et Chemique, and Kali und Salz Ag. Denison Mines Limited remains the overall development manager, with potash sales to be handled by Potacan.

A feasibility study completed in 1982 resulted in a production decision announcement on February 7, 1983.

Work on the No. 2 shaft, the production shaft, commenced in 1983, along with continued underground development and the construction of the surface infrastructure related to the mill facility, tailings storage, and brine disposal. By December 31, 1984 the No. 2 shaft had reached a depth of 769 m.

PRESENT OWNERSHIP 60% Denison Mines Ltd., 40% Potash Company of Canada (Potacan)

RESERVES AND GRADE Underground exploration in 1982 has blocked out over 41,000,000 tonnes of 28.5% K_2O, sufficient for the initial 5 years of production. Together with the 22 surface drill holes, the underground work to date has established total reserves of 230,000,000 tonnes (proven and possible).

PRODUCTION Production is planned for mid-summer 1985 with a rated capacity of 1,300,000 product tonnes annually.

DEVELOPMENT Work proceeded ahead of schedule on both mine and mill facilities in 1984. The second shaft was at a depth of 769 m by the end of 1984 and all surface facilities were nearing completion. The brine pipeline to the Bay of Fundy was completed and work was well underway on the rail spurline to connect the mine site with the main CN rail line at Moosehorn Creek.

EMPLOYEES Over 700 persons have been employed during the construction phase. It is anticipated the mine and mill will create full-time employment for up to 300 persons.

OUTLOOK Production expected by July 1985.

SILICA

Lockhart Exploration Services Ltd. 21 H/12

COMPANY The Sussex silica deposit is owned by Lockhart Exploration Services Ltd., P.O. Box 515, Fredericton,

New Brunswick E3B 5A6. Telephone: (506) 455-3508. The Executive Officer and President is W. Lockhart. The Manager is W. Lockhart.

RIGHTS 938.9 ha under Claim Blocks 1016, 1017, and 1018, Mining Act Chapter M-14, R.S.N.B. 1973.

LOCATION Deposit of unconsolidated silica sand about 16 km southwest of Sussex, immediately northeast of Cassidy Lake.

HISTORY The deposit was discovered in 1982. After 'proving-up' sufficient reserves of high-quality material, a pilot plant was set up in 1983 for product testing and marketing.

PRESENT OWNERSHIP Lockhart Exploration Services Ltd.; Baskatong Quartz Ltd. of Quebec also have interests in the property.

RESERVES AND GRADES Approximately 9 million proven tonnes and over 22 million tonnes possible reserves of silica sand containing greater than 98% SiO_2 are indicated.

PRODUCTION Laboratory testing has indicated that the silica sand could meet specifications for glass and blasting sand production with minimum beneficiation. Use as foundry sand would not appear possible due to the angular shape which would have insufficient permeability.

Production in 1983 was 25,000 tonnes, and in 1984 was 2,000 tonnes.

DEVELOPMENT Product testing continued including the possibility for use as a raw material for silicon metal.

EMPLOYEES None.

OUTLOOK Additional tonnage of several thousand tonnes will be processed for testing in silicon metal production at Becancour, Quebec, but further development of the deposit will depend on market conditions.

ENERGY RESOURCES[1]

In August 1984, the Government of Canada and N.B. Power announced that a circulating fluidized-bed boiler would be constructed at the Chatham generating station to supply steam to the 22 MW turbine generator. This demonstration project is to prove circulating fluidized-bed technology for the co-combustion of high-sulphur New Brunswick coal and oil shale.

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1 Written by D.E. Barnett, C. St. Peter

Canadian Occidental Petroleum Ltd., who have the rights to oil shale in the Albert Mines area under Development Permit L7401, have accepted the principle of supplying oil shale to the test facility and plan to develop a mine plan for possible production in 1985.

OIL SHALE

Canadian Occidental Petroleum Limited 21 H/15E

COMPANY Canadian Occidential Petroleum Limited, 1500, 635-8th Avenue S.W., Calgary, Alberta T2P 3Z1. Telephone: (403) 234-6700. The President is J. Angus McKee and the General Manager (oil shales) is E. Yildirim.

RIGHTS The company retains a 1439 ha bituminous shale Development Permit L7401 under the Bituminous Shale Act, Chapter B-4.1, R.S.N.B. 1976 (figure 11).

LOCATION The permit tract lies in the Albert Mines area about 25 km south-southeast of Moncton in Albert County.

HISTORY Bituminous shale was first reported at Albert Mines by Dr. Abraham Gesner in 1841. The area is best known for the solid hydrocarbon (albertite) vein that was discovered there by John Duffy in 1851. The vein was mined out between 1852 and 1880.

The importance of the oil shales first gained attention between 1854 and 1856 when Dr. Gesner retorted a burning oil from them. Following the closure of the albertite mine in 1880, the area attracted little interest until 1902 when R.W. Ells of the Canada Department of Mines began to study the oil shales. In 1942 the Canada Department of Mines drilled 36 shallow core holes near the old mine. In 1968, the Atlantic Richfield Company Limited drilled 2 holes at Albert Mines. One of these holes assayed 63 L/t of shale oil over 130 m.

PRESENT OWNERSHIP Canadian Occidental Petroleum Limited is a public company, with 48% ownership by Occidental Petroleum Limited and 52% by shareholders.

RESERVES AND GRADES In 1942, the Canada Department of Mines estimated there were 90,900,000 tonnes of oil shale averaging 44 L/t, yielding about 300,000 barrels of shale oil to a depth of 120 m. In 1982, the Geological Survey of Canada and the New Brunswick Department of Natural Resources estimated there were about 270,000,000 barrels of oil in situ to a depth of 600 m.

PRODUCTION In 1974, Canadian Occidental Petroleum Limited acquired the rights to the Albert Mines area by means of a Licence to Search covering 404,700 ha in southeastern New Brunswick. They converted this licence in 1981 to a lease of about 29,138 ha. Between 1974 and 1981 nine core holes were

drilled and a high-grade oil shale zone partially delineated. In 1983, the lease area was reduced to 1,439 ha.

In 1984, Canadian Occidental began a resource evaluation based on previous drilling and surface mapping at the Albert Mines site. This program will be followed by an economic feasibility study and a preliminary mine plan assessment.

Canadian Occidental has provided several tons of oil shale to Umatac Industrial Processes of Alberta, Lurgi GmbH of Germany, and the New Brunswick Electric Power Commission. The samples will provide additional data on retorting and fluidized bed combustion characteristics of Albert Mines oil shale. Samples have also been given to the Chemical Engineering Department at U.N.B. where studies are underway on the kinetics of various reactions during oil shale combustion.

OUTLOOK Drilling and assay evidence indicate that the property has a good potential for an open pit mine that will, in the experimental stage, satisfy the shale demands for the N.B.E.P.C. Chatham demonstration project.

CHAPTER 4. PRODUCING MINES, QUARRIES, OIL & NATURAL GAS WELLS IN NEW BRUNSWICK

VALUE OF PRODUCTION[1]

The total value of minerals produced in New Brunswick during 1984 reached a record high of $603,663,438 as indicated by preliminary figures for the year (Table 7). This represents an 18.7% increase over the 1983 final figures of $503,593,800. All four groups experienced an increase for 1984 with metals and non-metallics showing the largest gains, while fuels and structural materials show only a very small increase (Table 8, Figure 15). The increase in the metals group was due to increased production of zinc whereas the full year's production of potash accounted for the increase in non-metallics. On a province-by-province basis in 1984, New Brunswick ranked first in the production of bismuth; second in zinc, peat moss, tungsten, potash and antimony; third in silver, lead and sulphur; and fifth in copper and coal.

The preliminary value of metals produced in 1984, which includes antimony, bismuth, copper, gold, lead, silver, tungsten and zinc, totalled $484,223,000, up from the 1983 final figure of $421,281,000.

The value for non-metallic or industrial minerals totalled $49,150,438, up from the 1983 final figure of $19,220,800.

The value of production of mineral fuels, which includes coal, oil and natural gas, experienced only a slight increase from the 1983 final figure of $29,707,000 to $30,343,000 for 1984.

The value of structural materials for 1984, which includes clay products, cement, lime, stone, sand and gravel totalled $39,947,000 (preliminary figure), a slight increase from $38,385,000 for 1983.

Mining is still considered to be New Brunswick's fastest growing industry as shown by the capital spending projections from the companies concerned. The value of minerals produced should exceed $1 billion by 1990 and provide more than 7,000 direct jobs by the end of the next decade. Figure 16 shows the locations of the non-renewable resource producers in the Province.

EMPLOYMENT[1]

There were 4,276 people directly employed at producing mines and quarries during 1984, which is a decrease of 158 from 1983. The 1984 figure breakdown is as follows: metals -

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1 Written by W.R. Carr

2,705; potash - 735; coal - 245; peat moss - 372 and structural materials - 219. Scientific, technical and administrative staff employed by the Provincial Government in support of mineral resource development totalled 45 during 1984.

Table 7

NEW BRUNSWICK MINERAL PRODUCTION
1984

(Preliminary Estimate)

	Units	Quantity	$ Value
METALS			
Antimony	kg	-----	827,000
Bismuth	kg	159,000	1,879,000
Copper	kg	7,186,000	13,631,000
Gold	g	502,000	7,573,000
Lead	kg	73,250,000	53,890,000
Silver	kg	136,000	47,704,000
Tungsten	kg	-----	12,000,000
Zinc	kg	246,424,000	346,719,000
TOTAL			484,223,000
NON-METALLICS			
Peat	t	145,000	12,831,000
Potash	t	-----	19,784,900
*Silica	t	-----	1,250,000
Salt	t	-----	7,457,538
Sulphur, in smelter gas	t	119,000	7,827,000
TOTAL			49,150,438
FUELS			
Coal	t	575,640	30,300,000
Natural Gas	m^3	2,000	28,000
Petroleum Crude	m^3	-----	15,000
TOTAL			30,343,000
STRUCTURAL MATERIALS			
Clay products		-----	3,550,000
Cement	t	-----	9,676,000
Lime	t	-----	5,506,000
Sand and Gravel	t	5,410,000	10,275,000
Stone	t	2,005,000	10,940,000
TOTAL			39,947,000
GRAND TOTAL 1984 (Preliminary)			$603,663,438

*Formerly reported as "Quartz".

Table 8

The Mineral Production of New Brunswick

1956 to 1984

Date Calendar Year	Metals	Non-Metallics	Fuels	Structural Materials	Total
1956	$ 337,234	$ 744,262	$ 8,155,040	$ 9,021,766	$ 18,258,302
1957	4,789,658	951,178	8,424,346	9,056,683	23,221,865
1958	1,114,700	944,321	6,964,888	8,576,845	17,600,754
1959	-----	941,330	8,533,822	8,636,080	18,111,232
1960	-----	1,101,722	8,834,749	7,136,268	17,072,739
1961	-----	1,379,335	7,686,695	9,738,355	18,804,385
1962	3,483,969	1,571,082	6,900,984	9,855,540	21,811,575
1963	9,255,246	1,224,450	7,352,023	10,511,700	28,343,419
1964	29,648,079	1,099,685	8,573,688	9,355,260	48,676,712
1965	62,461,357	1,742,662	8,742,980	9,210,353	82,158,352
1966	69,386,294	1,894,992	8,005,535	10,934,416	90,221,237
1967	67,957,099	2,427,150	7,568,509	12,465,932	90,418,690
1968	69,622,942	2,915,246	7,436,931	8,476,317	88,451,436
1969	77,562,887	3,603,831	5,757,473	7,668,374	94,592,565
1970	89,939,781	2,785,381	3,086,033	8,979,360	104,790,555
1971	91,049,256	2,902,648	4,038,971	9,242,071	107,232,946
1972	98,772,724	3,820,526	3,552,863	14,024,867	120,170,980
1973	132,797,907	4,243,694	3,434,416	23,701,754	164,177,771
1974	184,142,991	5,742,863	5,441,537	21,255,701	216,583,092
1975	197,230,888	6,252,923	7,473,197	20,965,912	231,922,920
1976	195,340,976	7,163,466	5,988,243	30,090,493	238,583,178
1977	238,583,350	10,037,550	6,333,791	34,439,352	289,394,043
1978	281,770,379	11,467,716	8,811,135	37,670,743	339,719,973
1979	419,123,591	11,658,369	10,394,844	38,510,412	479,687,216
1980	302,674,000	13,192,293	17,282,186	40,981,000	374,129,479
1981	452,580,000	16,666,976	23,325,535	39,769,000	532,341,511
1982	409,832,000	20,587,126	24,630,614	43,241,000	498,290,740
1983	421,281,000	19,220,800	29,707,000	38,385,000	508,593,800
1984(P)	484,223,000	49,150,438	30,343,000	39,947,000	603,663,438

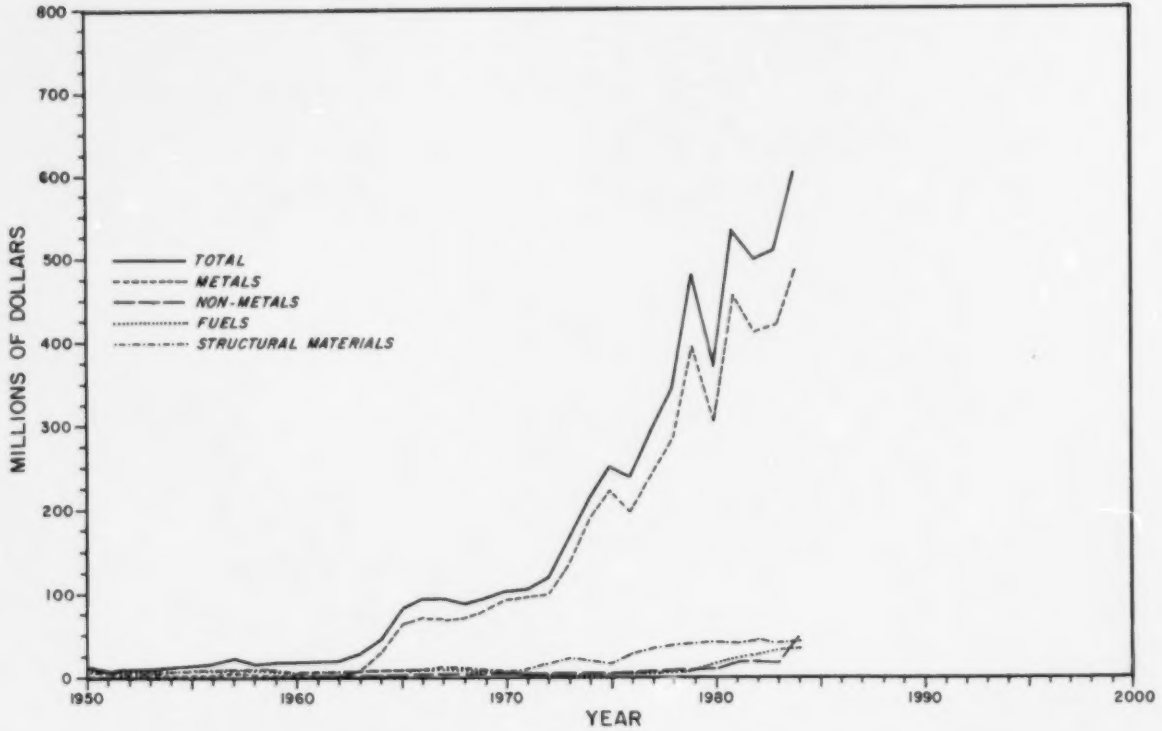

Figure 15. Value of mineral production in New Brunswick, 1950-1984.

METALLIC MINERALS[1]

Mount Pleasant Tungsten Deposit 21 G/7

LOCATION The Mount Pleasant property is situated about 50 km northeast of St. Stephen, Charlotte County.

HISTORY A group called Geochemical Associates staked Mount Pleasant in 1954 for Selco Exploration Limited. Selco drilled four holes in a geochemical anomaly, but no metallic minerals of interest were intersected and the property was returned to Geochemical Associates. In 1956, Kennco Exploration (Canada) Limited optioned the property and drilled ten holes, but the results were disappointing and Kennco dropped the option. Mount Pleasant Mines Limited staked the ground in 1959. Kennco optioned the property again and drilled several holes that intersected tungsten, molybdenum and tin minerals, but the option was dropped again, because the mineralized zone could not be followed. In 1960, a trenching and diamond drilling program combined with a detailed geological investigation by the Mount Pleasant Mines geological staff led to the discovery of a tin-base metal ore zone in the northern part of the property. Deep drill holes also intersected tungsten-molybdenum ores in the northern part of the property and in the Fire Tower zone, but lack of sufficient funds prevented systematic drilling of these deeper ore zones. The delineation of the complex geology of the property guided subsequent exploration by Sullico Mines Limited. This company optioned the property in 1967. Drilling by Sullico and later its wholly-owned subsidiary Brunswick Tin Mines Limited led to the delineation of the tungsten-molybdenum ore zones in the Fire Tower zone and in the northern part of the property. In 1977, Billiton Canada Limited and Brunswick Tin Mines Limited made a joint venture agreement to bring the property into production. Mill construction and underground work in preparation for production were completed in 1983, when the first commercial concentrates were produced.

COMPANY Mount Pleasant Tungsten Mine is owned and operated by Billiton Canada Ltd. with head offices at Suite 1006, 141 Adelaide Street West, Toronto, Ontario M5H 3L9. Mine Office address is P.O. Box 150, St. George, New Brunswick E0G 2Y0. The President is W. de Graaf and Vice President is John Bailey. The Mine Manager is R. McLatchy.

RESERVES (Reserves published in 1983) Reserves are estimated to be 12 220 000 tonnes grading 0.38% WO_3 and 00.20% MoS_2 in the Fire Tower zone. Additional reserves are indicated in the Fire Tower zone and the northern part of the property.

PRODUCTION Mill capacity is 2000 tonnes of ore per day. In 1984 the mill processed 546 208 tonnes of ore produc-

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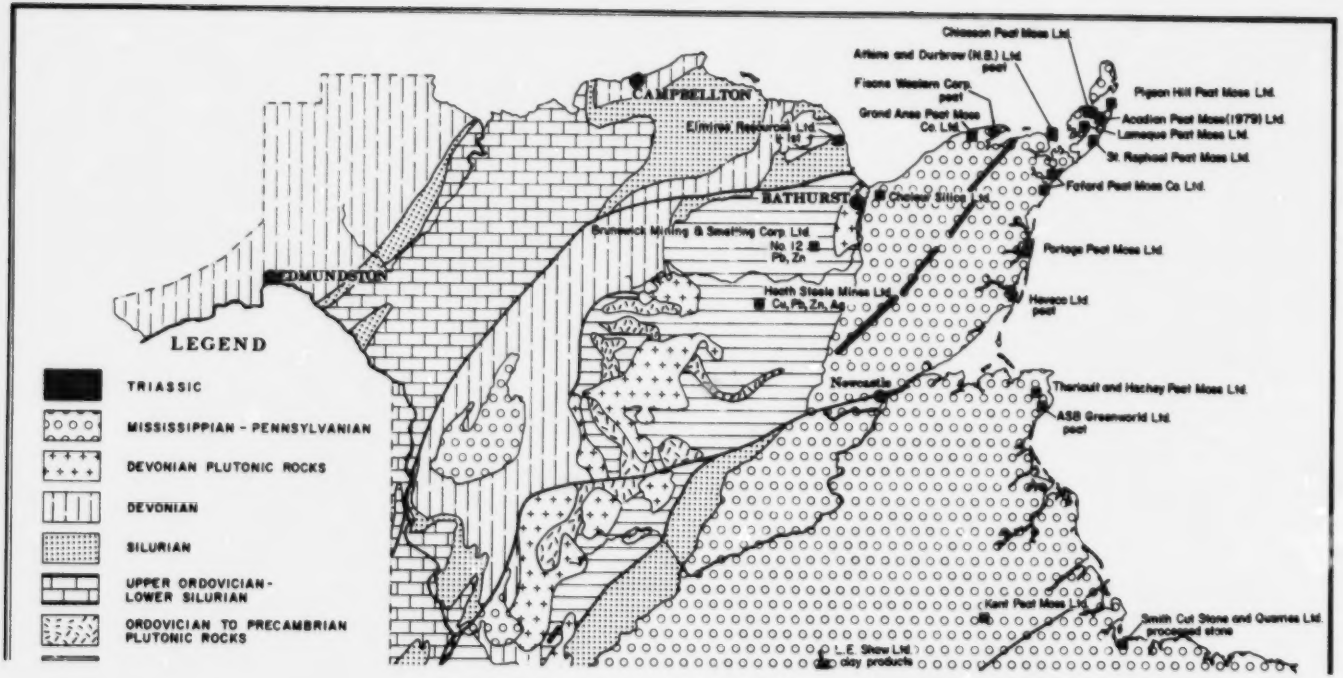
1 Written by J.J. Chandra


LEGEND
TRIASSIC
MISSISSIPPIAN - PENNSYLVANIAN
DEVONIAN PLUTONIC ROCKS
DEVONIAN
SILURIAN
UPPER ORDOVICIAN - LOWER SILURIAN
ORDOVICIAN TO PRECAMBRIAN PLUTONIC ROCKS
CAMPBELLTON
Elmtree Resources Ltd.
BATHURST
Chaleur Silica Ltd.
Brunswick Mining & Smelting Corp. Ltd. No. 12 Pb, Zn
Heath Steele Mines Ltd. Cu, Pb, Zn, Ag
EDMUNDSTON
Newcastle
Chaleson Peat Moss Ltd.
Arlene and Durbrow (N.B.) Ltd. peat
Fiscna Western Corp. peat
Grand Anse Peat Moss Co. Ltd.
Pigeon Hill Peat Moss Ltd.
Acadian Peat Moss (1979) Ltd.
Lameque Peat Moss Ltd.
St. Raphael Peat Moss Ltd.
Foford Peat Moss Co. Ltd.
Portage Peat Moss Ltd.
Havaco Ltd peat
Theriault and Hachey Peat Moss Ltd.
ASB Greenworld Ltd. peat
(Kent Peat Moss Ltd.)
Smith Cut Stone and Quarries Ltd. processed stone
L.E. Shaw Ltd. clay products

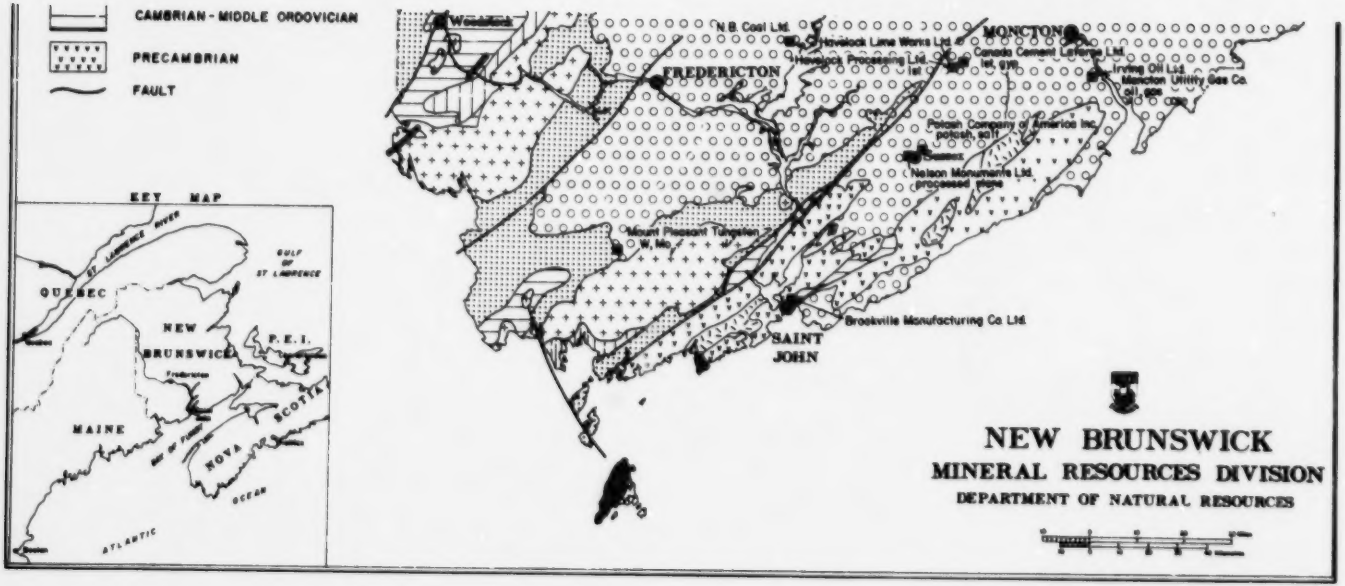


Figure 16. Non-renewable resource producers in New Brunswick in 1984.

ing 1472 tonnes of tungsten concentrate. In October 1984, the production rate was reduced from 650 000 t/y to 325 000 t/y.

EMPLOYEES The work force, which numbered 229 at the beginning of 1984, was reduced to 157 at year's end due to milling difficulties.

OUTLOOK Because of problems with the recovery of tungsten in the concentrator, the mine reduced production in October, 1984 and began operating on a 5-day week and the mill (concentrator) on a 3 1/3-day week. The company is presently carrying out metallurgical tests and these should be completed at the end of the third quarter in 1985 which would allow for a return to full production in the first quarter of 1986.

Heath Steele Mines Limited 21 O/8

LOCATION The Heath Steele mine is located 51 km northeast of Newcastle in Northumberland County (Lat. 47°17'N and Long. 66°05'W).

HISTORY The deposit was discovered in 1954 by airborne EM surveying. Mining began in 1957 but shut down between 1958 and 1962 because of low metal prices and poor recoveries. The mine reopened in 1962 with a contract to treat the ore from Cominco Wedge mine. In 1968, the mine began operating under the name Little River Joint Venture, managed and owned 75% by AMAX and 25% by INCO. In 1979, Noranda acquired AMAX's 75% share and ASARCO acquired INCO's 25% share. As a result of poor base-metal prices, the mine was forced to curtail production in 1983. It is now in a standby position.

COMPANY The mine operates under the name Heath Steele Mines Ltd. with head offices at P.O. Box 45, Commerce Court West, Toronto, Ontario M5L 1B6. Mine office address is P.O. Box 4000, Newcastle, New Brunswick E1V 3M5. President is J.C. White; Mine Manager is J. Johnstone.

RESERVES (As of December, 1984)

Mineral Inventory

Tonnes	Cu%	Pb%	Zn%	Ag (g/t)
16 806 000	1.26	1.62	5.00	66.49

PRODUCTION 1984 results are as follows:

	Tonnes	Ag (g/t)	Au (g/t)
Gossan treated	130 703.0	198.3	4.6
Precipitate produced	31.6	460 728.7	14 669.9

The mill was shutdown in September 1984.

DEVELOPMENTS On April 29, 1983 sulphide operations ceased due to low metal prices and diminished revenues. The plant was converted to treat gossan ores and recover gold and silver. This cyanide treatment process started in July 1983. After some start-up problems, the plant operated well, treating a peak of 570 S.D.T. per day. The gossan operations continued to October 1984.

The mine is now inoperative with a skeletal crew on maintenance pending a decision to reopen. On January 30, 1985 ASARCO decided to write off its 25% share of the Little River Joint Venture.

EMPLOYEES At the end of 1984, there were 70 employees on site. This has been reduced to 38, of which 19 are on half time.

Brunswick Mining and Smelting Corporation Limited

21 P/5

Brunswick operates one mine (No. 12), a concentrator and a lead smelter.

LOCATION The Brunswick No. 12 mine is located about 15 miles west of Bathurst in Gloucester County (Lat. 47°28.5' N and Long. 65°53.5'W). The concentrator is adjacent to No. 12 mine. The lead smelter is located at Belledune Point, about 45 km from the No. 12 mine.

HISTORY The presence of sulphides was noted in 1907; however, drilling of ground electromagnetic targets in 1952 located the No. 6 mine. Investigation of another electromagnetic anomaly on strike pinpointed the site of No. 12 mine in 1953. The property was granted to Brunswick Mining and Smelting, which was controlled at that time by St. Joseph's Lead Company. During the period 1953-57 an open pit and pilot mill were constructed at the No. 6 location. In 1961, interest transferred to M.J. Boylen, K.C. Irving, and Patino Corporation. Development commenced at No. 12 in 1962 and the mine production began in 1964. Production began at the No. 6 mine in 1966. In 1967, Noranda invested $50 million and gained control of Brunswick Mining and Smelting Corporation Limited and proposed a $50 million expansion. The expansion was started in 1974 and was completed in 1981. A total capital expenditure of $69 million was made at the mine and smelter between 1979 and 1981.

COMPANY Head Office - P.O. Box 45, Commerce Court W., Toronto; Mine Office - P.O. Box 3000, Bathurst; Smelter Officer - P.O. Box 2000, Belledune. The President is J.A. Hall; Operations Senior Vice President is J.C. White; Vice President, Mining is J.W. Moerman; Vice President, Smelting is A. Young.

EMPLOYEES As of December, 1984 there were 1 660 persons employed at the mine and 611 persons at the smelter.

RESERVES (December, 1984)

	Tonnes	Cu%	Pb%	Zn%	Ag (g/t)
Proven	79 438 000	0.31	3.72	9.15	98.2
Probable	25 029 000	0.37	3.71	8.58	96.8

PRODUCTION

	Tonnes	Cu%	Pb%	Zn%	Ag (g/t)
ORE					
No. 12 Mine	3 565 206	0.32	3.54	8.87	99.0
CONCENTRATE					
Copper	28 153	21.55	6.13	3.81	3 064
Lead	215 183	0.42	32.60	5.55	456
Zinc	448 502	0.28	2.08	51.76	94
Bulk	80 218	0.65	18.98	32.33	335
Pyrite	537	1.10	2.72	15.60	189
Tailings	2 787 613	0.10	1.10	1.65	37
SMELTER (metal)					
Lead (t)		57 000			
Silver (kg)		105 000			
Sulphuric Acid (t)		184 700			
Copper matte/speiss (t)		4 000			

DEVELOPMENTS The company has abandoned plans for the construction of an electrolytic zinc plant at Belledune.

Production from the No. 6 mine has ceased. No change is anticipated in Brunswick's production in the coming fiscal year. Fill material is being brought in from a quarry at No. 12 and backfilling operations are progressing very well. Brunswick is also considering blast hole mining in parts of the mine.

The smelter is forecasted to produce at the 1984 level over the next year. The company is continuing the study of the 'flash' smelter process.

NON-METALLIC MINERALS[1]

Fourteen companies were engaged in the production of peat moss in 1984, including the first year of production for Kent Peat Moss Ltd. from their bog 0.6 km west of Birch Ridge in Kent County. Peat moss production was adversely affected by above normal precipitation in May, June and part of July which reduced production to about 85% of the 1983 level. Shipments for 1984, however, showed an increase over the 1983 level as a result of shipments being related to the previous year's production (figure 17 and 18).

Peat Shipments
(previously reported as production)

Year	Bale Equivalents*
1980	2,301,000
1981	2,973,000
1982	3,035,000
1983	3,900,000
1984	4,062,000

The Potash Company of America Inc. continued to produce potash and salt, with potash production still suffering from problems of excess brine and tailings disposal. By the year's end, the company had installed additional evaporators and was working on other methods to overcome tailings disposal problems. Salt was still being mined at about the 400,000 tonne level with sales being handled by Iroquois Salt Products Ltd.

Limestone production continued at Brookville Manufacturing Co. Ltd., Havelock Processing Ltd., and Elmtree Resources Ltd., although Canada Cement Lafarge Ltd. maintained the closure of its cement kilns at Havelock. No decision was made by Elmtree Resources Ltd. to construct a lime kiln or to add additional crushing equipment to handle the hard dolomitic stone from the Armstrong Brook area.

Chaleur Silica Ltd. continued silica production from the Bass River quarry site with most of the product going to the Belledune smelter of Brunswick Mining and Smelting Corporation Ltd. for flux.

L.E. Shaw continued production of clay products at Chipman and is optimistic about future production. Nelson Monuments Ltd. and Smith Cut Stone continued production of dimension stone, although most of Nelson's stone is now coming in from out-of-province sources.

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1 Written by D.E. Barnett, R. Shaw, T.C. Webb, J. Thibault, P. O'Leary

* 1 bale equivalent = 170 dm^3 at a 2:1 compression ratio.

Figure 17. Ditching operation on developed peatland: ditching is done continuously, as peatlands must be kept drained to facilitate drying and to support production equipment.

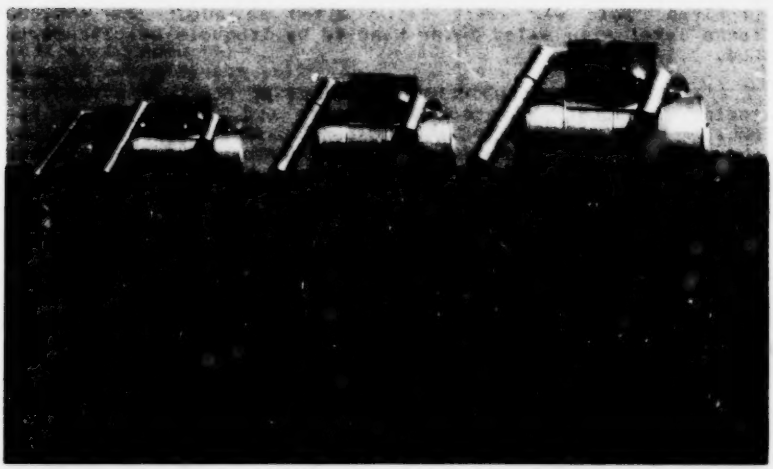

Figure 18. Vacuum harvesting of peat moss: each vacuum is capable of harvesting 30,000 bales of peat annually.

In the area of aggregates, eight companies continued to produce crushed stone to meet the demand for high specification aggregates in certain parts of the province. Sand and gravel production continued at a slightly lower level than in 1983 although production from Crown lands was up by 87%.

PEAT

Acadian Peat Moss (1979) Ltd.

COMPANY Acadian Peat Moss (1979) Ltd., P.O. Box 240, Lameque, New Brunswick E0B 1V0. Telephone: (506) 344-2426. The President is Elphege Chiasson; the Manager is Jean-Marc Savoie.

RIGHTS Peat Moss Lease No. 13 (232 ha) on Bog No. 568 under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 568 is adjacent to the Couteau Road on Lameque Island, Gloucester County.

HISTORY Established in 1965, the company originally produced block-cut peat, but now also produces milled peat. Following a disastrous fire in 1981 the company assumed full production in 1982.

PRESENT OWNERSHIP Acadian Peat Moss (1979) Ltd.

RESERVES AND GRADE 7.33 Mm^3 surficial and 3.41 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog >1 m	206	134	340
In Production	128	16	144

PRODUCTION Company has an annual production capacity of 320,000 bale equivalents.

EMPLOYEES 1984 - 6 to 54 persons.

DEVELOPMENT Continued expansion of existing lease. Production from Bog No. 567, held under lease by La Tourbiere Chiasson, is usually included in production figures since the only bagging facilities are located at Bog No. 568.

ASB Greenworld Ltd.

COMPANY ASB Greenworld Ltd., Pointe Sapin, Kent County, N.B. E0A 2A0. Telephone: (506) 876-3937. The Manager is Guenter Worfel.

RIGHTS Peat Moss Lease No. 19 (627 ha) on Bog No. 324E, under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 324E is located 1 km northwest of Pointe Sapin in Kent County.

HISTORY Company commenced site preparation in 1978 prior to acquiring a lease in 1982.

PRESENT OWNERSHIP ASB Greenworld Ltd.

RESERVES AND GRADE 57.29 Mm^3 surficial and 12.26 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	1591	386	1977
>1 m	1360	183	1543
In Production	130	32	162

PRODUCTION Company produces baled peat and peat-soil mixes and has an annual production capacity of 360,000 bale equivalents.

DEVELOPMENT Company continued to work towards increasing the ratio of soil mixes to baled peat:

1981 produced 50% peat + 50% mixes
1982 produced 40% peat + 60% mixes
1983 produced 40% peat + 60% mixes
1984 produced 30% peat + 70% mixes

EMPLOYEES 1984 - 11 to 30 persons.

OUTLOOK Company will gradually reduce baled peat sales to 10 to 15% with bulk of production consuming peat in soil mixes. A rail system will be installed in 1985 for transporting peat from the bog to the plant.

Atkins and Durbrow (N.B.) Ltd.

COMPANY Atkins and Durbrow (N.B.) Ltd., P.O. Box 88, Bas Carquet, Gloucester County, New Brunswick E0B 1E0. Telephone: (506) 727-3385. The Manager is Eino Kivipato.

RIGHTS Peat Moss Lease No. 7 (202 ha) on Bog No. 600, under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1963.

LOCATION Bog No. 600 is located on Pokesudie Island.

HISTORY Company has been producing peat since 1886, but first commenced production in New Brunswick in 1965. Following a disastrous fire in 1978, they rebuilt their operation and resumed production in late 1980.

PRESENT OWNERSHIP Atkins and Durbrow (N.B.) Ltd.

RESERVES AND GRADE 2.2 Mm^3 surficial and 1.38 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	179	215	394
>1 m	128	22	150
In Production	113	1	114

PRODUCTION Company produces baled peat and has an annual capacity of 110,000 bale equivalents.

DEVELOPMENT Continued peat production.

EMPLOYEES 1984 - 1-30 persons

OUTLOOK Continued peat production subject to market conditions.

Chiasson Peat Moss Ltd.

COMPANY Chiasson Peat Moss Ltd., P.O. Box 112, Lameque, New Brunswick E0B 1V0. Telephone: (506) 344-2426. The President is Elphege Chiasson; the Manager is Gilles Haché.

RIGHTS Peat Moss Lease No. 23 (76 ha) on Bog No. 567 under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 567 is located 3 km southeast of Little Shippagan.

HISTORY Company acquired an Exploration Licence in 1982 and converted to a lease in the same year.

PRESENT OWNERSHIP La Tourbe Chiasson Ltée.

RESERVES AND GRADE 2.21 Mm^3 surficial and 1.06 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	65	38	103
>1 m	53	21	74
In Production	50	20	70

PRODUCTION Company produces baled peat and has an annual production capacity directly related to that of Acadian Peat Moss (1979) Ltd. Product is presently baled at the Acadian Peat Moss (1979) Ltd. facility owned by the same principals.

DEVELOPMENT Continued baled peat production.

OUTLOOK Continued expansion to full development potential, including construction of a bagging facility to handle production from Bog No. 567.

Fafard Peat Moss Co. Ltd.

COMPANY Fafard Peat Moss Co. Ltd., P.O. Box 70, Shippagan, Gloucester County, New Brunswick. Telephone: (506) 366-2325. The Manager is Rene Martin.

RIGHTS Peat Moss Lease Nos. 4 (364 ha), 5 (506 ha) and 6 (607 ha) under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION All bogs are in Gloucester County.

Lease	Bog No.	Size (ha)	Location
4	530	364	Pokemouche Bog, off Route 113 at Inkerman
5	532	506	Six Road Bog, 15 km south of Shippagan
6	529	607	Inkerman Ferry Bog, 8 km southwest of Shippagan

HISTORY Commenced production at Bog 530 in 1941 producing block-cut, hand-cut peat. Similarly produced block-cut peat from Bog No. 532 until shifted to milled peat in 1966. Commenced mechanized block-cut peat in 1971, but then ceased all block-cut operations in 1977. Presently produces only milled peat from 3 bogs.

PRESENT OWNERSHIP Fafard Peat Moss Co. Ltd.

RESERVES AND GRADE

Bog No.	Surficial (Mm^3)	Humified (Mm^3)
529	7.80	14.59
530	8.15	3.22
532	11.49	6.77

Bog areas include the following:

	Crown (ha)	Freehold (ha)	Total (ha)
Bog 529			
Total Bog	663	311	974
>1 m	468	140	608
In Production	113	3	116
Bog 530			
Total Bog	416	67	483
>1 m	387	41	428
In Production	120	12	132
Bog 532			
Total Bog	370	206	576
>1 m	360	134	494
In Production	274	50	324

PRODUCTION Company produces baled peat and peat mixes and has an annual capacity of 1,250,000 bale equivalents.

DEVELOPMENT Continued to develop the remaining potential on Bog Nos. 529 and 532. Sections of Bog No. 530 that were originally hand cut have been abandoned.

EMPLOYEES 1984 - 11 to 30 persons.

OUTLOOK Continued production on an annual basis of about one million bale equivalents subject to market and climatic conditions.

Fisons Western Corp.

COMPANY Fisons Western Corp., Maisonnette, New Brunswick E0B 1X0. Telephone: (506) 727-3428. The Manager is Edward Puhacz.

RIGHTS Peat Moss Lease Nos. 10 (1724 ha) and 12 (396 ha) under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION

Lease	Bog No.	Size (ha)	Location
10	527	1724	1 km south of centre of Shippagan on Lameque Island
	591		
	592		
12	562		6 km east of Lameque at Maisonnette

HISTORY Western Peat Moss Co. Ltd. started production in British Columbia in 1938-39. Commercial production in New Brunswick commenced in 1964 on Bog 562. Western produced on Bog 527 from 1942-48 and commenced production from Bog 562 in 1963. Atlantic produced from Bog 527 from 1953 to 1970-71. They also produced from Bog 591 commencing in 1952. Western acquired Atlantic in 1970 and continued production from Bogs 562 and 591. Fisons acquired Western Atlantic in 1980 and incorporated under the name of Fisons Western Inc. in 1981. Subsequently, the new plant on Bog 591 on Lameque Island opened in 1981.

PRESENT OWNERSHIP Fisons Western Corporation

RESERVES AND GRADE

Bog No.	Surficial (Mm^3)	Humified (Mm^3)
527	7.56	3.32
591	30.70	14.81
592	9.40	4.59
562	9.65	3.53

Bog areas include the following:

	Crown (ha)	Freehold (ha)	Total (ha)
Bog 527			
Total Bog	315	290	605
>1 m	240	137	377

(Abandoned in 1970-71 due to fire hazard to the Town of Shippagan)

	Crown (ha)	Freehold (ha)	Total (ha)
Bog 591			
Total Bog	978	256	1234
>1 m	909	151	1060
In Production	288	55	343
Bog 592			
Total Bog	365	224	589
>1 m	318	82	400
In Production			
Bog 562			
Total Bog	373	168	541
>1 m	331	48	379
In Production	288	51	339

PRODUCTION Company produces baled peat and high compression peat and has an annual production capacity of 1.5 million bale equivalents.

DEVELOPMENT Continued development of Bog 591 which will lead to development on Bog 592.

EMPLOYEES 1984 - N/A.

OUTLOOK Continued production at about 1.0 million bale equivalents subject to market and climatic conditions.

Grand Anse Peat Moss Co. Ltd.

COMPANY Grande Anse Peat Moss Co. Ltd., P.O. Box 90, Grande Anse, Gloucester County, New Brunswick E0B 1R0. Telephone: (506) 732-2854. The President is Paul Tocci; the Manager is Ernest Roy.

RIGHTS Peat Moss Lease No. 8 (166 ha) on Bog No. 561, under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 561 is located 3 km southeast of Grande Anse.

HISTORY Started block-cut peat operations in 1961 by hand cutting, but later converted to mechanization in 1966. Started conversion to milled peat in 1977.

PRESENT OWNERSHIP Grande Anse Peat Moss Co. Ltd.

RESERVES AND GRADE 4.13 Mm^3 surficial and 2.98 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	137	188	325
>1 m	118	125	243
In Production	114	77	191

PRODUCTION Company produces baled peat and peat mixes and has an annual production capacity of 170,000 bale equivalents.

DEVELOPMENT Continued production.

EMPLOYEES 1984 - 8 to 45 persons.

OUTLOOK Continued production at close to capacity but subject to market and climatic conditions.

Heveco Ltd.

COMPANY Heveco Ltd., P.O. Box 30, Tabusintac, Northumberland County, New Brunswick E0C 2A0. Telephone: (506) 779-9277. The Manager is Myles Wishart.

RIGHTS Peat Moss Lease Nos. 9 (1080 ha) and 24 (174 ha) under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 522 (Lease 24) is 2 km east of Brantville and Bog No. 524 (Lease 9) is 2 km southeast of Tabusintac.

HISTORY Incorporated in 1962 the company produces block-cut peat and peat mixes. Commenced milled peat production in 1981.

PRESENT OWNERSHIP Heveco Ltd.

RESERVES AND GRADE

Bog No.	Surficial (Mm^3)	Humified (Mm^3)
522	4.26	1.56
524	38.00	10.69

Bog areas include the following:

	Crown (ha)	Freehold (ha)	Total (ha)
Bog 522			
Total Bog	164	29	193
>1 m	145	16	161
In Production			
Bog 524			
Total Bog	909	327	1,236
>1 m	841	287	1,128
In Production	248	37	285

PRODUCTION Company produces block-cut peat and peat mixes and has an annual production capacity of 400,000 bale equivalents.

DEVELOPMENT Continued production from Bog No. 524.

EMPLOYEES 1984 - 3 to 86 persons.

OUTLOOK Bog 524 has numerous lakes throughout, which have caused drainage problems and thus reduced the area in production. The development planned for Bog 522 is to harvest from the bog and transport the raw peat to the existing plant at Covedell.

Lameque Peat Moss Ltd.

COMPANY Lameque Peat Moss Ltd., P.O. Box 570, Lameque, New Brunswick E0B 1V0. Telephone: (506) 779-9277. The Manager is Florent Chiasson.

RIGHTS Peat Moss Lease No. 14 (142 ha) on Bog No. 580 under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 580 is 4 km north of Lameque in Gloucester County.

HISTORY Established in 1971, producing milled peat.

PRESENT OWNERSHIP Lamèque Peat Moss Ltd.

RESERVES AND GRADE 6.24 Mm^3 surficial and 2.06 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	130	91	221
>1 m	120	50	170
In Production	100	7	107

PRODUCTION Company produces milled peat and has an annual production capacity of 135,000 bale equivalents.

DEVELOPMENT Continues to develop the Crown portion of bog to its full potential. Obtained a Peatland Exploration Licence for Bog No. 578.

EMPLOYEES 1984 - 5 to 33 persons.

OUTLOOK Company will complete evaluation of Bog No. 578 and ready for production after acquiring peat lease. Presently experiencing minor difficulties in acquiring freehold property which separates two tracts of Crown land.

Pigeon Hill Peat Moss Ltd.

COMPANY Pigeon Hill Peat Moss Ltd., P.O. Box 639, Lameque, New Brunswick E0B 1V0. Telephone: (506) 344-8530. The President is Edmond Chiasson.

RIGHTS Peat Moss Lease No. 18 (234 ha) on Bog No. 569 under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 569 is located at Pigeon Hill on Lameque Island, Gloucester County.

HISTORY Company acquired a Peat Lease in 1979.

PRESENT OWNERSHIP La Tourbe Pigeon Hill Ltee.

RESERVES AND GRADE 3.62 Mm^3 surficial and 2.17 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	250	40	290
>1 m	196	30	226
In Production	50	0	50

PRODUCTION Company produces milled peat and has an annual rated capacity of 110,000 bale equivalents.

DEVELOPMENT Continued to expand production fields as market dictates.

EMPLOYEES 1984 - 13 persons.

OUTLOOK Continued production at rated capacity subject to market and climatic conditions.

Portage Peat Moss Ltd.

COMPANY Portage Peat Moss Ltd., P.O. Box 180, Riviere du Portage, Northumberland County, New Brunswick. Telephone: (506) 395-2215.

RIGHTS Peat Moss Lease No. 16 (272 ha) on Bog No. 517, under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 517 is located 1.5 km east of Portage River, Northumberland County.

HISTORY Established in 1972 the company produces milled peat.

PRESENT OWNERSHIP Portage Peat Moss Ltd.

RESERVES AND GRADE 6.17 Mm^3 surficial and 1.03 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	243	9	252
>1 m	150	1	151
In Production	86	0	86

PRODUCTION Company has an annual production capacity of 190,000 bale equivalents.

DEVELOPMENT Continued to develop at a rate consistent with market demand.

EMPLOYEES 1984 - 1 to 26 persons.

OUTLOOK Continued production subject to market and climatic conditions.

St. Raphael Peat Moss Ltd.

COMPANY St. Raphael Peat Moss Ltd., P.O. Box 570, Lameque, New Brunswick E0B 1V0. Telephone: (506) 344-8530.

RIGHTS Peat Lease No. 17 (115 ha) on Bog No. 576, under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog 576 is 4 km east of Haut Lameque, Lameque Island.

HISTORY Acquired Peat Lease No. 17 in 1977.

PRESENT OWNERSHIP St. Raphael Peat Moss Ltd. is a 'sister' company of Lameque Peat Moss Ltd.

RESERVES AND GRADE 3.65 Mm^3 surficial and 1.93 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	113	104	217
>1 m	105	35	140
In Production	105	25	130

PRODUCTION Company has an annual production capacity of 165,000 bale equivalents. Produces baled peat.

DEVELOPMENT Continued peat production with bog operating at capacity.

EMPLOYEES 1984 - 3 to 32 persons.

OUTLOOK Continued peat production subject to market and climatic conditions.

Theriault and Hachey Peat Moss Ltd.

COMPANY Theriault and Hachey Peat Moss Ltd., R.R. # 1, Baie Ste. Anne, Northumberland County, New Brunswick E0C 1A0. Telephone: (506) 228-4530. The President is Isaac Theriault; the Vice President is Gary Williston.

RIGHTS Peat Moss Lease No. 11 (552 ha) on Bog No. 324W under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog Nc. 324W is located 6 km south of Eel River Bridge, Northumberland County.

HISTORY Company was formed in 1963, but started to produce block-cut peat in 1961 and continued until 1977 when it converted to milled peat.

PRESENT OWNERSHIP Theriault and Hachey Peat Moss Ltd.

RESERVES AND GRADE 324W has 71.87 Mm^3 surficial and 18.13 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	2858	181	3039
>1 m	2340	51	2391
In Production	90	2	92

PRODUCTION Company has an annual production capacity of 200,000 bale equivalents.

DEVELOPMENT Attempting to open up new production fields.

EMPLOYEES 1984 - 2 to 31 persons.

OUTLOOK Plans to reduce size of present peat lease and apply for a second lease. Will be installing new screening equipment to produce peat for the expanding Japanese market.

Kent Peat Moss Ltd.

COMPANY Kent Peat Moss Ltd., R.R. # 2, St. Paul, Kent County, New Brunswick E0A 2B0. Telephone: (506) 955-3098. The Manager is Eloi Maillet.

RIGHTS Peat Lease No. 25 (393 ha) on Bog No. 41, under the Quarriable Substances Act, Chapter Q-1, R.S.N.B. 1968.

LOCATION Bog No. 41 is 0.6 km west of Birch Ridge, Kent County.

HISTORY Company acquired a peat exploration licence in 1982 and converted to a lease in 1983.

PRESENT OWNERSHIP Les Equipments Tardif Inc., 55, R.R. # 1, St. Antonin, Riviére-du-loup, Quebec G0L 2J0. Telephone: (506) 862-7574. The President is Leonard Tardif.

RESERVES AND GRADE 4.76 Mm^3 surficial and 2.18 Mm^3 humified peat on a total bog area as follows:

	Crown (ha)	Freehold (ha)	Total (ha)
Total Bog	264	80	344
>1 m	163	53	216
In Production	Only started small production in 1984		

PRODUCTION Company plans to achieve an annual rated capacity of 250,000 bale equivalents.

DEVELOPMENT Company drained part of the bog in 1983 and commenced production in 1984.

EMPLOYEES 1984 - N/A.

OUTLOOK Gradual increase to full production subject to market and climatic conditions.

POTASH/SALT

Potash Company of America Inc. 21H/11W, H/14W

COMPANY Potash Company of America, P.O. Box 1489, Sussex, New Brunswick E0E 1P0. Telephone: (506) 433-5445. The Executive Officer and President is P. Jack; the Mine Manager is P. Atkinson.

RIGHTS 19,187 ha Mining Lease, under Section 15(2) of Mining Act, Chapter M-14, R.S.N.B. 1973.

LOCATION The Potash Company of America mine/mill facility is located about 5 km east of Sussex, Kings County, on Highway 2.

HISTORY Following the discovery of potash in the Plumweseep-Penobsquis area by the New Brunswick Department of Natural Resources in 1971, exploration and development rights covering a 360 km^2 reservation area were granted to the Potash Company of America in 1973. After a comprehensive exploration program and feasibility study, the company decided to proceed with the construction of a 15 m diameter exploratory mine shaft in the spring of 1978. The exploration shaft was completed in April 1980 and underground exploration in October 1980. On October 27, 1980 the Potash Company of America announced that it was proceeding to production with a mine capacity of 900,000 tonnes per year although initial capacity will be 630,000 tonnes.

Mine development, mill construction and the Courtenay Bay potash shipping terminal in Saint John were completed in 1983. July 17, 1983 saw the first potash produced from the mill. The first shipment of potash through the port facility in Saint John took place early in 1984.

PRESENT OWNERSHIP Ideal Basic Industries, Ideal Plaza, 950 - 17th Street, P.O. Box 8789, Denver, Colorado 80201-8789

RESERVES AND GRADE Sufficient tonnage has been indicated by drilling to support a 1,000,000 tonne per year plant for 20 years or more.

PRODUCTION Potash and salt production, which commenced in 1983, continued throughout 1984 although potash production is proceeding at a reduced capacity due to problems with excess brine production and backfilling of tailings underground. Salt sales are handled by Iroquois Salt Products Ltd. under an agreement with P.C.A.

DEVELOPMENT Installation of a dehumidifier unit on surface to remove moisture from ventilation air and reduce condensation problems underground. Continuation of work to

create additional mine openings underground, through salt mining, to facilitate backfilling of tailings (figure 19). Additional brine evaporation capacity was installed in the mill to solve the problem of excess brine created during processing.

In the latter part of 1984, Ideal Basic Industries Inc., the parent company of the Potash Company of America Ltd., announced that they were going to sell all their potash interests, including mines in New Brunswick, Saskatchewan and New Mexico. To date no sale has been announced, but it should not affect production from either of the Canadian mines.

EMPLOYEES 260 (average number).

OUTLOOK Potash markets appear reasonably good for 1985 with small increases in prices and anticipated salt production will continue at about 400,000 tonnes per annum.

Figure 19. Alpine miner used underground at the Potash Company of America mine near Sussex.

LIMESTONE/DOLOMITE/GYPSUM

Brookville Manufacturing Company Ltd. 21 H/5

COMPANY Brookville Manufacturing Company Ltd., P.O. Box 2332, Saint John, New Brunswick E2L 3V6. The Executive Officer and President is R.H. Oland; the Mine Manager is M. Sanford.

RIGHTS Original King's Land Grant

LOCATION Brookville, East Saint John, Saint John County. Quarry and crushing operation located between Highway 1 (Sussex-Saint John Highway) and Highway 100 (Rothesay Highway) approximately 2 km east of their junction. Access to the quarry is via the Rothesay Highway.

HISTORY The company commenced operations over 60 years ago, primarily producing agricultural limestone and aggregate. It has been operating almost continuously since.

PRESENT OWNERSHIP R.H. Oland (Moosehead Breweries Ltd.).

RESERVES AND GRADE At present market levels, at around 300,000 tonnes annually, adequate reserves of stone are estimated for at least 10 years. Although grade varies between areas of high calcium limestone and dolomite throughout the quarry, the bulk of production is centred in the more dolomitic areas where grades fluctuate from 40 to 45% $MgCO_3$.

PRODUCTION The company produces agricultural dolomitic limestone, concrete, asphaltic aggregate and road metal.

DEVELOPMENT Continued operation.

EMPLOYEES 28 (average number).

OUTLOOK Market outlook will most likely maintain the same or slightly above levels established in previous years. As the principal product is ag lime, any growth in production will be dependent on spring weather conditions and a stabilized low interest rate at financial institutions. Possible competition in the dolomitic ag lime market may eventually come from Elmtree Resources Ltd., who are in the process of developing a dolomitic limestone property in northern New Brunswick.

LIMESTONE/GYPSUM

Canada Cement Lafarge Ltd. 21 I/13W

COMPANY Canada Cement Lafarge Ltd., R.R. # 1, Havelock, New Brunswick E0A 1W0. Telephone: (506) 534-2301. The Manager is Pierre Hebert.

RIGHTS 632.5 ha Mining Licence No. 1217 (includes existing plant and quarries); 205.5 ha Mining Licence No. 1168 (Springhill property); 302.7 ha Mining Licence No. 1090 (Intervale property); All Mining Licences are under Mining Act, Chapter M-14, R.S.N.B. 1973.

LOCATION The limestone quarries and plant are located on Highway 880, about 5 km east of Havelock, Westmorland County.

The gypsum quarry is located less than 5 km north of Petitcodiac, Westmorland County.

HISTORY The limestone quarry near Havelock has been supplying raw material to the nearby cement plant since 1952. In 1983, the company announced plans to scale down its cement production at Havelock due to depressed market conditions. The operation of the cement kiln was subsequently suspended; however, the grinding plant continued to operate on a demand basis from stockpiles of clinker built up before the shutdown, as well as from clinker brought in periodically from another plant in Nova Scotia.

Initial quarrying of gypsum at Intervale began in 1880. The Albert Manufacturing Co. produced 1179 t/y (1,300 tons/year), between 1932 and 1935. In 1950, the property was acquired by Canada Cement Co. Ltd. who have worked the quarry periodically, supplying gypsum to the cement plant at Havelock.

PRESENT OWNERSHIP Canada Cement Lafarge Ltd. (Maritime Cement Ltd.).

RESERVES AND GRADE Reserves of high-grade limestone (i.e. 53% CaO) on property held under mining licence by Canada Cement have been estimated between 75 and 100 million tonnes.

At Intervale, reserves of 97% gypsum have been estimated at just less than 4 million tonnes.

PRODUCTION Historically, Canada Cement has produced approximately 200,000 to 300,000 tonnes of limestone annually, primarily for use in cement manufacturing. Recently, production has included aggregate as well as some high-calcium stone sold to Havelock Processing Ltd.

Between 5,000 and 25,000 tonnes of gypsum per year have been produced from Intervale as required.

DEVELOPMENT Company kilns remained shut down during 1984. Grinding operations of stockpiled clinker continued on an intermittent basis. Plans are being made to 'fire up' one of the two kilns in 1985 to produce 60,000 tonnes of clinker for specialty cements, i.e. oil well and sulphate resistant cements. This kiln will operate for about 5 months (May to September) with a work force of 65 to 70 persons.

Clinker for normal portland cement will continue to be brought in from Nova Scotia.

EMPLOYEES 28 (average number).

OUTLOOK Continued normal portland-type cement production from indigenous Havelock limestone would seem unlikely. The fact that Canada Cement's modern and efficient Brookfield plant in Nova Scotia is only operating at about 50% capacity, would indicate that the current soft market conditions for this type of cement may continue for some time.

Production of specialty cement for the offshore oil exploration industry appears brighter because of the better grade of limestone in the Havelock area.

Continued gypsum production at Intervale will depend on cement manufacture.

LIMESTONE

Elmtree Resources Ltd. 21 P/13W

COMPANY Elmtree Resources Ltd., P.O. Box 665, Bathurst, New Brunswick E2A 3Z6. Telephone: (506) 546-6382. The Executive Officer and President is A. Buzas; the Manager and Vice President is G.M. Doucet.

RIGHTS 245.9 ha Mining Licence No. 1360, under Mining Act, Chapter M-14, R.S.N.B. 1973.

LOCATION The quarry is located about 20 km north of Bathurst near the Village of Petit Rocher, Gloucester County.

HISTORY A quarry has existed on this site since 1880 and was operated on a 1,814 t/y (2,000 ton/year) basis from 1930 to 1960 by Elmtree Co-op. Since 1960, it was operated on an intermittent basis until 1978 when it was acquired by Elmtree Resources Limited. Following extensive trenching and mapping, the quarry was expanded to include a crushing, screening plant and a large storage facility.

PRESENT OWNERSHIP Elmtree Resources Ltd.

RESERVES AND GRADE Reserves appear to be adequate in the explored area for at least 10 years operation at current production levels. Cut-off grade is 50% CaO.

PRODUCTION Limestone is quarried and crushed, and is primarily sold to the smelter at Belledune as flux, although some is marketed as agricultural lime and construction stone.

DEVELOPMENT Continued operation. The company conducted a feasibility study into the possibility of installing

a lime kiln for quick lime and slaked lime production from additional high-grade calcic limestone near Sormany. In addition, alterations to existing crushing equipment at the plant are anticipated to accommodate the crushing of dolomite from the Armstrong Brook area west of Bathurst.

EMPLOYEES 9 (average number).

OUTLOOK Reserves appear adequate for the foreseeable future. Decisions have to be made concerning the purchase of new crushing equipment for the Armstrong Brook dolomite as well as possible lime kiln construction. Both decisions will be affected by the limited market size and market penetration.

Havelock Lime Works Ltd. and Havelock Processing Ltd.
21 H/13W

COMPANY Havelock Lime Works Ltd. and Havelock Processing Ltd., P.O. Box 59, Havelock, New Brunswick E0E 1W0. Telephone: (506) 534-2311. The Executive Officer and President is A. Alward; the General Manager is L. Murray.

RIGHTS

50.9 ha Mining Licence No. 1129 (includes plant).
66.2 ha Mining Licence No. 1268 (undeveloped).
110.9 ha Mining Licence No. 1176 (undeveloped).
39.8 ha Mining Licence No. 1170 (operating quarry).
38.4 ha Mining Licence No. 1207 (operating quarry and processing facility).
97.1 ha Claim Block 260 (undeveloped).

All rights are under Mining Act, Chapter M-14, R.S.N.B. 1973.

LOCATION Company operates a permanent quarry and processing facility about 5 km west of Petitcodiac and less than 1 km east of the Village of Havelock, respectively.

HISTORY Havelock Lime Works Ltd. has been quarrying in the area since 1939. The company was incorporated in 1964 and in 1970 a subsidiary company, Havelock Processing Ltd., was formed to manage the manufacturing of quick and hydrated lime. More recently, Dickenson Mines Ltd. acquired 60% interest in the Havelock group of companies in 1983. The company plans to acquire the balance of the operation within the next three years.

PRESENT OWNERSHIP Dickenson Mines Ltd., 60%; and A. Alward, 40%.

RESERVES AND GRADE Less than 1.0 million tonnes of 95% $CaCO_3$ remain at Havelock's Samphill quarry following current extraction practices. However, this tonnage can be increased if a greater overburden-to-stone stripping ratio can be economically achieved.

PRODUCTION The company has traditionally produced about 250,000 to 300,000 tonnes of stone annually. Chemical process stone (for use as flux in nonferrous smelters, glass industry, pulp and paper mills and fibreglass), pulverized stone (for use in dusting mines and agricultural purposes), poultry grit, and crushed stone (for use as concrete aggregate and general construction) are all listed products.

DEVELOPMENT Expansion plans are underway at the company's Samphill quarry to increase reserves. Recently, studies were undertaken to look into:

(a) energy conservation, and
(b) productivity gains through:

(i) upgrading existing kiln, and
(ii) addition of a new vertical type kiln of 181 t/d (200 tpd) capacity.

EMPLOYEES 12 (average number).

OUTLOOK Continued production with a possibility of expanding into new product lines.

SILICA

Chaleur Silica Limited 21 P/12E

COMPANY Chaleur Silica Limited, P.O. Box 4, Site 4, Petit Rocher, New Brunswick E0B 2E0. Telephone: (506) 783-2387. The Executive Officer, President and Manager is Jean Claude Godin.

RIGHTS Original King's Land Grant.

LOCATION Quarry located approximately 6.5 km east of Bathurst, Gloucester County, just south of Highway 11.

HISTORY The property was originally explored by East Coast Smelting and Chemical Company in 1961; however, the property remained undeveloped until 1974, when World Wide Explorations opened a small quarry. The quarry was purchased by Godin M-E in 1976 and is now operated under the name of Chaleur Silica Limited. It has since been expanded and modernized. A sandblast sand plant, with 77 to 91 t/d (85 to 100 tons/day) capacity of bagged sand, was installed in 1979.

In 1983, the company drilled five holes on a second property adjacent to the Nepisiguit River and intersected 10 m of silica similar to that already being quarried.

PRESENT OWNERSHIP The deposit is owned by A. Ronalds and G. Ronalds under an original King's Grant and mined under an agreement with Chaleur Silica Limited.

RESERVES AND GRADE Reserves are estimated to be in excess of 500,000 tonnes of 95% SiO_2.

PRODUCTION The quarry operates on a seasonal basis and has produced up to 60,000 tonnes of silica annually. Markets are almost entirely dependent on the sale of silica flux to the smelter at Belledune; however, some blasting sand and nursery sand has been produced.

DEVELOPMENT Continued operation at a reduced level.

EMPLOYEES 14 (average number).

OUTLOOK With 90% of the market being the smelter at Belledune, the company is extremely vulnerable to the one client. Depressed prices offered by the smelter or other competition could result in severe economic hardship for Chaleur Silica Limited.

CLAY PRODUCTS

L.E. Shaw Limited 21 I/4

COMPANY L.E. Shaw Limited, Head Office: P.O. Box 2130, Lantz, Nova Scotia B0N 1R0. Plant and Quarry Office: P.O. Box 188, Chipman, New Brunswick E0E 1C0. Telephone: (506) 339-6605. The Manager is George Roberts.

RIGHTS The company owns about 40 ha of land. Quarriable substances are vested in the owner of the land in or on which they lie.

LOCATION The quarry is located about 3 km east of the plant, in Chipman, New Brunswick.

HISTORY In 1929, the company opened a plant in the heart of the Minto coal field at Chipman to use waste shales from the coal mines in making brick and tile. Since 1935, raw material for the plant has been obtained from the shale quarry.

PRESENT OWNERSHIP L.E. Shaw Limited.

RESERVES AND GRADE Material is removed from the Hurley Creek Formation and consists of purple-red sandstone, shale and siltstone.

PRODUCTION A preliminary estimate of the value of clay product production for 1984 is $3.55 million, compared to $3.20 million in 1983.

DEVELOPMENT The company continued to operate a brick plant using local red shale. The plant produces facing brick, drainage tile, partition tile, radial tile and an interlocking tile. Quality acid-resistant brick can also be produced.

EMPLOYEES Three in the quarry operation and 45 in the manufacturing sector.

OUTLOOK Generally good, but directly related to the construction industry.

PROCESSED (DIMENSION) STONE

Nelson Monuments Ltd. 21 H/12

COMPANY Nelson Monuments Ltd., P.O. Box 1220, Sussex, New Brunswick E0E 1P0. Telephone: (506) 433-3413. Contact: Merrill Nelson.

RIGHTS Quarriable substances are vested in the owner of the land in or on which they lie.

LOCATION The plant is located in Sussex, New Brunswick, but quarries have been operated in various places: Charlotte County, Hampstead, and Vermillion Bay (Ontario).

HISTORY The company was founded in 1909 and in 1959 it moved from Hopewell Cape to Sussex.

DEVELOPMENT The company continued to produce monuments, markers and curbing stone, although much of the granite used was imported from Ontario and South Africa.

EMPLOYEES 17 to 23 in 1984.

Smith Cut Stone and Quarries Limited 21 I/2

COMPANY Smith Cut Stone and Quarries Limited, P.O. Box 69, Shediac, New Brunswick E0A 3G0. Telephone: (506) 532-6902. The President is Roy E. LeBlanc.

RIGHTS Quarriable substances are vested in the owner of the land in or on which they lie.

LOCATION Shediac, New Brunswick.

HISTORY Founded in 1818, this is the oldest company in New Brunswick. It has provided building stone for numerous construction projects, including Moncton's Cathedral. For the last 25 years it has mainly provided cut stone for restoration.

DEVELOPMENT The company continued to operate a local sandstone quarry and was involved in restoration projects in Boston and New York.

EMPLOYEES 1 to 12 in 1984.

CRUSHED STONE

Major operations producing crushed stone for use as aggregate are centred around the Fredericton and Moncton areas. Both of these areas are deficient in good quality, coarse, surficial granular aggregate materials.

In the Fredericton area, Diamond Construction Limited maintains a crushing operation at Springhill, on the south side of the Saint John River. The material crushed is a Silurian greywacke. On the north side of the river, Forbes and Sloat Limited crushes Mississippian basalt at a quarry at Douglas, just west of Fredericton.

In the Moncton area, Moncton Crushed Stone Company Limited, a subsidiary of Modern Enterprises, crushes granitic rocks of Precambrian age at a quarry at Stilesville, northwest of Moncton. This company also produces manufactured fine concrete aggregate by blending crusher-produced fine aggregate with washed natural sand trucked in from the Rogersville area. H.E. Carson Limited also produces crushed stone from the Stilesville area. To the east of Moncton, at Gaytons, Precambrian granitic rocks are crushed by Acadia Crushed Stone Limited, another subsidiary of Modern Enterprises, and by MacDonald's Paving and Construction Limited.

In addition to the above, Brookville Manufacturing Company Limited of Brookville, near Saint John, and Havelock Lime Works of Havelock, produce crushed dolomite and limestone, respectively, for use as aggregate, in addition to their other lime products.

Preliminary estimates of stone production for 1984 (Statistics Canada figures) are 2,005,000 tonnes with a value of $10,940,000. In comparison, 1983 production was 2,087,000 tonnes valued at $11,310,000.

SAND AND GRAVEL

The rights to surficial granular aggregate materials in New Brunswick are vested in the landowners. Consequently, permission of the land owner is required for sand and gravel extraction. Approximately 42% of the land area is controlled by the Province. Removal of sand and gravel from this land is regulated under the Quarriable Substances Act, with permits being issued by the Minister of Natural Resources.

Preliminary estimates of sand and gravel production in New Brunswick during 1984 (Statistics Canada figures) are 5,410,000 tonnes, with a value of $10,275,000. In comparison, production in 1983 was estimated at 5,668,000 tonnes, valued at $10,830,000.

Production of sand and gravel from Crown land and designated areas was 2.26 million tonnes, with a value of

$4.29 million, compared to 1.21 million tonnes valued at $1,800,000 in 1983.

ENERGY RESOURCES[1]

Oil and Natural Gas continued to be produced in limited quantities from the Stoney Creek Field about 16 km south of Moncton.

N.B. Coal Ltd. continued production from the Minto coalfields at about the same level as in 1983. They carried out further exploration as well as completed a feasibility study on the purchase of a second large dragline.

OIL AND NATURAL GAS

Moncton Utility Gas Company 21 H/15

COMPANY Moncton Utility Gas Company, 382 St. George Street, Moncton, New Brunswick E1C 1X2. Telephone: (506) 855-9901. The manager is P. Furlong.

RIGHTS Gas production under Lease ONG 74-1 of the Oil and Natural Gas Act, Chapter O-2.1, R.S.N.B. 1976 (figure 11).

LOCATION The Stoney Creek Field is located 16 km south of Moncton, Albert County.

HISTORY In 1899, the New Brunswick Petroleum Company Limited was organized. Frederick W. Sumner and Mathew Lodge were president and secretary, respectively. The company procured a licence to prospect and develop oil and gas on an area of 46,619.8 km^2 (18,000 square miles) for 5 years. An extension of 5 years was to be granted should the company meet certain conditions, one of which was an expenditure of $100,000. Upon termination of the 5-year extension, Lease 115 was granted specifying that the New Brunswick Petroleum Company Limited had drilling rights to 25,899.9 km^2 (10,000 square miles) for a term of 99 years with a renewal clause for an additional 99 years.

Investigations for the New Brunswick Petroleum Company Limited were conducted by Professor N.S. Shaler, H.B. Goodrich, R.H. Oliphant and others. From 1900 to 1906, 72 wells were drilled in the Dover and St. Joseph areas, one at Beersville in Kent County and four between the Petitcodiac River and the present Stoney Creek Field.

The five wells drilled outside the Dover-St. Joseph area were unsuccessful in locating commercial oil and gas.

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1 Written by D.E. Barnett, A.T. Martel, R. Shaw

Figure 20. Pumpjack in operation in the Stoney Creek oil and gas field near Hillsborough.

Half of the 72 wells drilled in the Dover-St. Joseph district yielded oil, the majority ranging from 1/2 to 2 1/2 bbl/day. One well is reported to have produced oil at a rate of 50 bbl/day.

In 1908, Maritime Oilfields Limited (MOL), backed by Scottish and English capital, acquired the drilling rights of the New Brunswick Petroleum Company Limited. In 1909, oil and gas were discovered in what is now the Stoney Creek Field. The first well that was drilled in the Stoney Creek Field, Well MOL 3, yielded some oil and 4,247.55 m^3/day (150,000 cu. ft./day) of gas, and Well MOL 5 yielded 2,8317 m^3/day (1,000,000 cu. ft./day).

Moncton Tramways, Electricity and Gas Company was the gas distributor. Gas was supplied to Moncton by a 24.4 cm (9 5/8 in.) pipeline, 16 km in length and to Hillsborough by a 10.8 cm (4 1/4 in.) pipeline, 10.7 km long, built in 1912. In 1913, gas was sold by the distributing company for 38 cents net per 2.83 m^3 (1,000 cu. ft.) and 15 to 16 cents for commercial purposes.

In 1915, the New Brunswick Gas and Oilfields Limited was formed and acquired Lease 115 from Maritime Oilfields Limited. In 1947, New Brunswick Oilfield Limited purchased New Brunswick Gas and Oilfields Limited and farmed out part of the property to Shell, who in 1957 entered a farm-out partnership with Imperial Oil. Shell and Imperial drilled 5 and 6 wells, respectively, but failed to discover commercial oil and gas.

Western Decalta Petroleum Limited purchased New Brunswick Oilfields Limited in 1962 with an idea to increase production by the secondary scheme of waterflood. The waterflood, initiated in 1968, increased oil production in a few wells and watered out some of the best gas wells. Subsequently, the waterflood program was abandoned in 1972.

Western Decalta sold the Stoney Creek field (2,119.8 ha) to Aldis Petroleum in 1974, but retained the remainder of the leased land. However, the 99-year lease signed in 1909 on 25,899.9 km^2 (10,000 square miles) was, upon agreement between the New Brunswick Government and New Brunswick Oilfields Limited, reduced to a 21-year lease on January 1, 1958. In addition, 404,743.7 ha were relinquished at the same time and an additional 809,424.3 ha and 1,036,841 ha in 1960 and 1975, respectively. On January 1, 1979 all land except that under production reverted to the Crown.

In 1977, Aldis Petroleum dealt the Stoney Creek Field to Eastern Canada Hydrocarbon Limited of Fredericton, who in turn sold their rights to the present lease holder and operator, Irving Oil Limited.

PRESENT OWNERSHIP Moncton Utility Gas Company is 100% owned by Irving Oil Limited.

PRODUCTION

Year	Production (m^3)
1909 to 1979	790,083,000
1980	2,200,000
1981	2,000,000
1982	1,700,000
1983	1,700,000
1984	2,100,000

EMPLOYEES Four in 1984.

OUTLOOK Continued production at about $2x10^6$ m^3 in 1985. Possible drilling of exploration well in the Stoney Creek Field in 1985.

IRVING OIL LIMITED 21 H/15

COMPANY Irving Oil Limited, P.O. Box 1421, Saint John, New Brunswick E2L 4K1. Telephone: (506) 632-2000.

RIGHTS Oil production under Lease ONG 74-1 of the Oil and Natural Gas Act, Chapter O-2.1, R.S.N.B. 1976 (figure 11).

LOCATION The Stoney Creek Field is located 16 km south of Moncton, Albert County.

HISTORY See Moncton Utility Gas Company (p. 132).

PRODUCTION

Year	Production (m^3)
1909 to 1979	123,430
1980	600
1981	320
1982	100
1983	750
1984	450

OUTLOOK Continued production of several hundred cubic metres in 1985. Possible drilling of exploration well in the Stoney Creek Field 1985.

COAL

N.B. Coal Ltd. 21 I/4W, J/1E

COMPANY N.B. Coal Ltd., P.O. Box 520, Minto, New Brunswick E0E 1J0. Telephone: (506) 327-3336. The President is A. Cormier; the Mining Engineer is J. Beck.

RIGHTS Mining Licence 1307 under the Mining Act, Chapter M-14, R.S.N.B. 1973

LOCATION Minto-Chipman area, Queens County. Licence is bounded to the south at 46°00'N, to the north by 46°14'N, to the east by 65°41'W and to the west by 66°15'W.

HISTORY Established in 1969 as a wholly-owned subsidiary of the Grand Lake Development Corporation, N.B. Coal Ltd. was formed to phase out mining operations in the Minto coalfields. In 1971, the last coal from underground mining was produced.

With the advent of the Arab oil embargo in 1973, coal which was previously deemed uneconomical, again became important as an energy source. In 1974, a Marion 8200, 50 m^3 dragline was ordered and began production in August 1979.

PRESENT OWNERSHIP N.B. Coal Ltd.

RESERVES AND GRADE Reserves are estimated at 14 million tonnes with potential for a further 15 to 20 million tonnes. The coal, despite having good burn characteristics, has both a high ash and sulphur content.

PRODUCTION Coal has been mined in the Minto-Chipman area since 1639, but until recently only from the Minto Formation. Recent exploration has proven coal of the Sunbury Creek Formation to be mineable (Fire Road Mine).

Mine sites are located at Salmon Harbour, Eighteen Brook, Fire Road, Coal Creek and Solomon Brook. The company operates six draglines and contracts the services of three others. Production potential per annum is 550,000 to 600,000 tonnes.

Production: 1983 - 564,640 tonnes.
1984 - 557,848 tonnes.

DEVELOPMENT Continued exploration program as well as feasibility for purchase of a second large dragline.

EMPLOYEES 1984 - 250 persons.

OUTLOOK Company has reserves mineable by the 8200 dragline for many years to come, but production from the other equipment will be limited by its capability to mine at greater depths. Purchase of another large dragline would increase the company's ability to mine at greater depths.

Additional production may also be realized using modified mining methods as being practiced at the Eighteen Brook Mine.

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